CW SAMPLE COPY
MI48103UIVYMUIVYM FCWB FC
UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48103

NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices ©1978 by CW Communications/Inc.

No. 18 May 1, 1978 75¢ a copy;$18/year

An IBM Surprise: No Bid to Toss Out Case

By Catherine Arnst
CW Staff

NEW YORK — Contrary to most expectations, IBM did not ask that the U.S. vs. IBM antitrust case be thrown out of court on grounds of insufficient evidence when the government brought its direct case to an end here last week.

Observers were surprised because IBM lead attorney Thomas D. Barr had said as early as March 1977 he would make such a motion, and he did not announce his change of mind until the government rested its case. So, almost three years after the start of this mammoth case, IBM began its defense.

IBM has always made such motions in private antitrust actions brought against it. In two cases, Greyhound Computer Corp. vs. IBM and California Computer Products, Inc. vs. IBM, those motions were granted. However, the Greyhound decision was overturned on appeal and the suit was sent back for a new trial.

IBM's motion to dismiss was denied recently in the Memorex vs. IBM trial in San Francisco [CW, April 10].

IBM opened its defense on the 473rd day of trial since the case opened in court May 19, 1975. During that time, some 4,950 documents have been placed in evidence — 3,200 government exhibits, 1,700 from IBM and 50 joint exhibits.

(Continued on Page 8)

Burroughs Gives B6800 Mid-Life Power Kicker, Subs In Mid-Size Line

By Frank Vaughan
CW Staff

DETROIT — Burroughs Corp. has given its B6800 series of large-scale systems a mid-life performance boost with the introduction of four models. The vendor also effectively replaced its medium-scale product line with the announcement of five models in that size range.

In addition, the firm also introduced a data communications subsystem and adjusted prices on its existing large-scale systems.

The large-scale CPUs boast significant increases in power over the models in the B6800 family they will ultimately replace, Burroughs claimed. The single-CPU models B6808 and B6812 offer 40% more performance than the B6807 and B6811, respectively, while the dual-processor B6818 and B6822 offer a similar performance increase over the B6817 and B6821, according to a spokesman.

Within the line, the B6812 and B6822 employ "optimized memory access logic" to provide 25% more power than the B6808 and B6818, he said, attributing the performance increases to a recoding of the micrologic and the use of 16K N-channel memory devices.

On the medium-scale side of the ledger, the entry-level B2805 provides a 33% performance increase over the older entry-level B2802, while the other models making their debut provide an average of 21% better price/-performance than previous models in the mid-scale range, he stated.

All of the systems introduced can be configured with up to four CPUs, the spokesman noted, explaining two B6818s would be equal in power to one B6822 with Global memory.

In addition, all of the large-scale models can be configured with up to

(Continued on Page 6)

Senate Eyes Boardrooms

DP Study Finds Firms Interlocking

By Edith Holmes
CW Washington Bureau

WASHINGTON, D.C. — Leaders of major U.S. corporations constantly rub shoulders in boardrooms across the nation, and by doing so, they flirt with antitrust violations and court conflicts of interest, according to a computer-based study released by a Senate subcommittee here last week.

In the first serious study in more than a decade on interlocking directorates among the country's largest corporations, the Senate Governmental Affairs Committee's Subcommittee on Reports, Accounting and Management, under the direction of the late Sen. Lee Metcalf (D-Mont.), examined 130 of the top industrial corporations, financial institutions, retailing organizations, transportation companies, utilities and broadcasting companies.

With the assistance of the staff of the Senate Computer Center and its IBM 370/158, the subcommittee found 530 "direct interlocks" — cases in which two companies had a common director — and 12,193 "indirect interlocks" — in which two companies each had a director on the board of a third company — among the 130 corporations studied.

The computerized study of these companies, whose assets total over $1 trillion — about 25% of the assets of all U.S. corporations — led the subcommittee staff to conclude that "American business is highly concentrated across industry lines" — perhaps more concentrated than it was in 1914, when

(Continued on Page 5)

User Posts Electronic Mail Success

By Don Leavitt
CW Staff

STAMFORD, Conn. — "A study wouldn't teach us nearly as much as getting in and using a working system," Leonard G. Levy said recently in discussing an electronic mail pilot project implemented late last year at Combustion Engineering, Inc. (CE) here.

CE's Automatic Transmission of Mail (Atom) system was developed on a shoestring, according to the manager of advanced systems, who noted many organizations have spent more on studies than he did in creating and installing Atom and training people to use the system.

Based on an IBM 370/168, Atom gives each participant a secure electronic mailbox that houses all mail sent to or from him. By using a terminal almost anyplace in the world, he can create mail or scan, read, print, pend or forward (with notations) mail sent to him by others.

Atom has weaknesses, he acknowledged, but that was expected. It was designed as a "throw-away" system, meant only to provide a limited number of users with "live" experience so they could help define the needs of a follow-on production version.

Probably the biggest weakness is Atom's dependence on IBM's Time Sharing Option (TSO), Levy said. That software was used because it was in place and Atom's developers knew how to make the TSO edit functions easily accessible to the end users.

But TSO was a costly choice since all editing is done on-line, expending computer and communications resources at a rate that will be unacceptable if the production system is built and made available to "everyone at CE above the rank of PFC," as Levy expects to happen "someday."

That could put quite a burden on the system. CE has a teleprocessing network consisting of more than 80,000 miles of leased phone lines in North

(Continued on Page 8)

Picky Burglar Makes Off With $20,000 in Hardware

By Brad Schultz
CW Staff

STORRS, Conn. — Computer hardware valued at nearly $20,000 was stolen recently from the University of Connecticut's Institute of Materials Science here, resulting in the shutdown of $300,000 worth of equipment with which the stolen items were interfaced.

The institute and police are speculating that the thief is "very professionally competent" because the stolen hardware was carefully selected from a vast array of devices, according to Ben Z. Rubin. Rubin is a research associate at the institute.

The thief was neat and methodical, taking items from different rooms and different systems and even returning screws to their positions on the installation racks, Rubin said. This indicated the thief probably plans to set up a small business with the haul, rather than attempt resale, he added, theorizing the thief may be a student at the university who is about to graduate and leave the area.

The stolen equipment has been identified as:

- A Digital Equipment Corp. PDP-8/E

(Continued on Page 8)

IN DEPTH
IN DEPTH
IN DEPTH

Satellite Business Systems is sure to spur new applications, John Gantz believes, even though the technology is not new. "SBS: Catalyst for Action" begins on Page 24.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM reg. U.S. Pat. Off.

EDITORIAL
Editor — E. Drake Lundell Jr.
Deputy Editor — Ronald A. Frank
Managing Editor — Nancy French
Associate Editor — Donald Leavitt
Assistant Editor — Frank Vaughan
Washington Bureau/ Chief — Edith Holmes
Staff Writers — Catherine Arnst, Jeffry Beeler, Marcia Blumenthal, Howard Karten, Timothy J. Scannell, Brad Schultz, Marguerite Zientara
Chief Copy Editor — Cheryl M. Gelb
Copy Editors — Barbara T. VanScoyoc, Susan Gerrard, Joe Hunn
Photography Editor — Ann Dooley
Editorial Assistant — Denise Petski
Editorial Cartoonist — Jim Orton
Contributors:
Education — J. Daniel Couger
Legal — Roy N. Freed
Taylor Reports — Alan Taylor
Human Connection — Jack Stone

SALES
Vice-President — Roy Einreinhofer
Advertising Administrator — Terry Williams
Display Advertising — Mary Anne Furlong
Classified Advertising — Kathy Steinberg
Sales Promotion Director — Jack Edmonston
Market Research — Kathryn V. Dinneen

CIRCULATION
Vice-President — Margaret Phelan
Circulation Manager — Barbara Jeannetti
Customer Service Rep — Peggy Kelly
Assistant — Eleanor Smith

PRODUCTION
Manager — Lee Vidmer
Supervisor — Henry Fling
Assistant Manager — Peter Holm
Typesetting Supervisor — Donna Turnbull

Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone: (617) 965-5800. Telex: USA-92-2529
OTHER EDITORIAL OFFICES: Washington, D.C. : 821 National Press Building, 529 14th Street N.W., Washington, D.C. 20045. Phone: (202) 347-6718. **England:** Roger Frampton, Computerworld Publishing Ltd., 2 Bath Road, London W41LN. Phone: (01) 995-3352, Telex: 934287. **W. Germany:** Hans-Jurgen Ballnath, Computerworld, c/o Computerwoche GmbH, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 34-90-61. Telex: 5215350. **Asia:** Hidetsuna Sasaki, Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: J2424461.
Second-class postage paid at Boston, Mass., and additional mailing offices PN127420. Published weekly (except: a single combined issue for the last week in December and the first week in January) by CW Communications/Inc. Copyright 1978 by CW Communications/Inc. All rights reserved. Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to Marion Kibbee.
75 cents a copy: U.S.— $18 a year; Canada and PUAS — $28 a year; Europe and Near East — $75 a year; all other foreign — $125 a year. Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.
Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

CW COMMUNICATIONS/INC.
Board Chairman/ Publisher — Patrick J. McGovern
President — W. Walter Boyd
VP-Marketing — Roy Einreinhofer
VP-Finance — William P. Murphy
VP-Circulation — Margaret Phelan

ABP MCC MEDIA DATA FORM

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, MA. 02160. ac

Memorex Trial 'Laid Back'

East vs. West: A Matter of Style

By Catherine Arnst
CW Staff

SAN FRANCISCO — The most visible difference between the Memorex Corp. vs. IBM antitrust trial here and the U.S. vs. IBM trial in New York is style. Both have the same issues and many of the same witnesses, and the participants of one are carefully studying the developments in the other.

But while the New York trial plods on in an atmosphere that is alternately dull and lifeless or charged with rancor, the Memorex trial resembles the city it is in — lighter, more relaxed and far more "laid back."

The primary reason for this difference is the 11 people who will decide the fate of Memorex's charges. The six women and five men are unskilled and unknowledgeable in DP — or were when the trial started in January. To hold their interest during the long trial days — the court sits from 9:30 a.m. to 5:30 p.m., while the New York court sits from 9:30 a.m. to 4 or 4:30 p.m. — the attorneys must present their case as clearly and as quickly as possible and in an attention-grabbing manner.

Consequently, there are a lot of large, multicolored charts and other visual aids accompanying the testimony, and witnesses try as much as possible to simplify the complicated processes they describe.

The attorneys, in turn, avoid inconsequential subjects that might lose the interest of the jury; their questions are generally clear and to the point.

A Matter of Record

In the government trial, there is no great need to make the procedure interesting, nor is there much attempt. The case is being heard and will be decided by a sole arbiter, Judge David N. Edelstein, and the prime concern of the plaintiff, defense and the judge is to "preserve the record."

The record will be the support for any decision Edelstein makes and it will be carefully studied by the appeals courts to assure that, based on the evidence, his decision was valid. Thus, both sides want every possible related piece of evidence and word of testimony in the record, no matter how trivial.

Analysis

At the Memorex trial, IBM started its defense case April 5 and expects to complete it the week of May 15. In one recent week, the testimony of four witnesses was completed.

In New York, there have been only four witnesses since last July.

New York Circus

It is not unusual for a trial before a judge to move more slowly and take longer than one tried by a jury, but U.S. vs. IBM has reached an extreme that caused Sen. Edward M. Kennedy (D-Mass.), chairman of the Senate Antitrust and Monopoly Subcommittee, to call it a "sideshow attraction" [CW, March 6]. A major element of its circus quality is the bitterness between the attorneys for the two parties.

Lawyers are often criticized by the general public for being able to argue either side and they often seem to be bitter enemies in the courtroom but good friends in private life.

In U.S. vs. IBM, however, several attorneys on each side have lost any semblance of professional respect for those on the other side and perceive each other only as the enemy.

There is an abysmally low level of cooperation between the parties; insults fly both in and out of court and each side is suspicious about even the most elementary actions of the other.

During a recent — and typical — court day, IBM attorney Ronald Rolfe accused government attorney Donald Resnikoff of trying to coach a government witness with his objections to Rolfe's questions on cross-examination. Resnikoff, in turn, accused Rolfe of asking questions that were "unfair" and making "ridiculous" objections.

Edelstein finally ordered both sides to leave the courtroom "if you can't act like gentlemen."

Friendliness in West

There is a glaring difference in San Francisco. Both Memorex lead attorney John Endicott and Patrick Lynch, his counterpart for IBM, are good-humored men who communicate easily, with a resulting high level of cooperation.

Several participants in the New York trial assume that those involved in the private action are only keeping up appearances for the sake of the jury, but it is evident that the friendliness remains once the jury has left the courtroom. Members of both teams are cordial at all times and seem to like and respect each other — an assumption one would never make of those involved in the New York case.

As a result, the Memorex trial has far more stipulations and a minimum of objections.

Some of the differences in style can also be attributed to the judges in the two cases. Edelstein, chief judge of the Southern District Court in New York, is very formal and insists on complete decorum in court. He finds little humor in the proceedings and often loses his temper when he believes his authority is being challenged, insulting attorneys and sometimes even specta-

(Continued on Page 8)

On the Inside This Week

NEWS
IBM and AT&T See Each Other on 15 Boards 4
Wide Software Range Serves Burroughs Additions . . 6
Avoid Salesman's Distractions, Report Warns 7
GM Program Rates Level of Text Difficulty 9
Energy Researchers Simulate Coal Gasification . . . 10
Monthly Examines Value of Arbitration Clauses . . . 11
Dangers Seen in Corporate Planning Trends 14
Handicapped Receive DP Operator Training 15
User Enthusiasm Called Key to DDP Success 16
Sheriffs' Offices to Pool Inmate Escort Teams 17
Seminars to Examine Small Systems in '80s 18
Library Saves $370,000 on System Conversion 19
Users Urged Not to Reject Third-Party Leases 20
Managers Held Responsible for Their 'Teams' 21
MIS Managers' Planning Needs Seen Growing 22
IN DEPTH: SBS: Catalyst for Action 24-30

EDITORIAL
Editorial: Loosening Old Ties 32
Human Connection: Humans Make Judgments 33
Taylor Report: Contracts, Responsibility Unclear . . 33
Abacus Works Well for Hex Calculations 34
DP Criminal at Large: End-Around Carrie 35

SOFTWARE & SERVICES
On-Line System Eases Dispersed Work 37
'UCC One' Upgrade Improves Tape Management . . 38
'Wylbur' Updated 40
'Flee-Flim' Now Builds DOS/VS Job Streams 42

COMMUNICATIONS
Packet Nets Give Terminal Independence 43
CDC Beefs Up Support on Net OS Software 44
Pix-II Software Gives Remote Device Priority 46
Commercial Bank, S&L Share Kansas EFT Net 47

SYSTEMS & PERIPHERALS
Univac Aids CPU, Data Entry System 49
Portable Power Short Circuits Hard-Wire Fees 50
RAM Fits Criterion CPUs 51
Image Processor Does Arithmetic 53

MINIWORLD
Mini/Micro Show Has Few Unveilings 57
Add-On Fits LSI-11 58
Yacht Club Sails Into Smooth Financial Waters 59

MICROCOMPUTING
National Semi Has Rack-Mounted MPU 61
Comptronics MPUs Based on F-8 62
Symposium to Discuss Benefits of Micros 63

COMPUTER INDUSTRY
Fraud Ruled in 1968 DEC Tape Patent 65
Transborder Debate Proving Charged 65
OECD Planning Guidelines 68
Small Business Needs Relief, Quantor Tells SEC . . 69
Daisy-Wheel Maker Enters Matrix Printer Area 71
Apple Vying for Share of Home DP Market 72
EMM Officer Turns Around Caelus Operation 73
Tax Planning Essential to Sellers of DP Firms 74

ADR's MetaCOBOL® Produces Fast, Error-Free COBOL Code for Owens-Illinois

George Shaw and Howard Abernathy are a part of O-I's Corporate DP Center team, serving the needs of 115 plants in the U.S., as well as installations overseas.

"Two years ago, O-I took a serious look at programming productivity and format standards," said George Shaw, Internal Projects Coordinator for O-I's corporate DP center. "Since the most expensive aspect of any new application is programming, we wanted to do everything we could to keep that cost down. One thing we needed was a way to shorten the process of coding COBOL programs.

MetaCOBOL shortened the process of coding COBOL programs.

MetaCOBOL met that need. It gave us a tool that would produce more accurate code and improve readability as well. A programmer can enter a short 3-line MetaCOBOL macro command, for example, and have it automatically expanded to 50 lines of error-free COBOL source code every time."

"Now, practically all our COBOL programmers use MetaCOBOL facilities," Shaw continued. "We've set up standards manuals with listings and instructions on how to use all the macros we've developed. Because we've developed so many and they're so easy to use, a programmer could use as many as 15 different macros to enter commands in his average program. As a result, productivity has increased dramatically."

"MetaCOBOL is a tremendous tool which allows us to get things done with less actual coding," added Special Projects Supervisor, Howard Abernathy. "We now wonder how we ever got along without it."

MetaCOBOL is ADR's COBOL-oriented software product for developing and maintaining programs at either the conventional COBOL level or at a higher level. It is now in use at more than 450 sites throughout the world for conversion from one COBOL dialect to another, for natural interfacing to a data base management system, for auditing for adherence to local programming standards, for structured

The use of MetaCOBOL macros resulted in a dramatic increase in productivity.

programming, for systematic testing, for code generation, and for dozens of other cost-effective applications. For many companies, MetaCOBOL is saving countless hours of programming effort while making dramatic improvements in overall program quality. For more information on what ADR software products can do for you, call or write .

To find out what MetaCOBOL can do for you — clip this.

☐Send MetaCOBOL product information and case histories. ☐Please call me. I would like a MetaCOBOL presentation.

Name/Title Company Address

City/State/Zip Telephone Computer Configuration

APPLIED DATA RESEARCH THE ON-LINE SOFTWARE BUILDERS™
Route 206 Center, Princeton, N.J. 08540, Phone: 609–924-9100

Each ADR product is not just a program but a complete package with full documentation and on-site support. ADR is the only software company with 50 branch offices and representatives in over 30 countries—each staffed with ADR-trained technicians.

ADR software products: in use at over 8000 installations worldwide. U.S. offices in Atlanta (404) 252-9130, Boston (617) 245-9540, Chicago (312) 694-2244, Cleveland (216) 826-0190, Houston (713) 526-3188, Los Angeles (213) 826-5527, New York (212) 986-4050, Princeton (609) 924-9100, San Francisco (415) 391-0690, Washington, D.C. (703) 281-2011. **International offices** in Australia, Austria, Belgium, Brazil, Canada, Denmark, England, Finland, France, Germany, Holland, Hong Kong, Israel, Italy, Japan, Korea, Malaysia, Mexico, New Zealand, Norway, Philippines, Portugal, Puerto Rico, Republic of South Africa, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, Venezuela.

IBM, AT&T Seen Together On 15 Boards

By Edith Holmes
CW Washington Bureau

WASHINGTON, D.C. — IBM and AT&T directors met each other across the boardroom tables of 15 different companies in 1976, according to a computer-aided study made by a Senate subcommittee.

"IBM is the leading participant in a fight against AT&T for a competitive part of the business communications market," the report, released last week, noted, yet "directors of IBM were found to interface with directors of AT&T on the boards of American Express, Bankers Trust, Chemical New York, Citicorp, Continental Illinois, J.P. Morgan, Caterpillar Tractor, Continental Oil, Du Pont, Mobil and U.S. Steel," the study said.

These "indirect interlocks" — instances in which IBM and AT&T each had a director on the board of a third firm — are not illegal, but they provide "substantial opportunity for direct policy discussions and potential understandings among these major competitors," according to the report from the Senate Governmental Affairs Committee's Subcommittee on Reports, Accounting and Management.

Based on its examination of 130 major U.S. corporations involved in various industries including retailing, finance, transportation, utilities and broadcasting, the subcommittee, which was chaired by the late Sen. Lee Metcalf (D-Mont.), has recommended that Congress outlaw all interlocking directorates between companies with over $1 billion in sales or assets.

The subcommittee believes such a law should extend to all lines of business because of the potential such links have for antitrust violations and conflicts of interest.

TELECOMMUNICATIONS INDUSTRY INDIRECT INTERLOCKS AMONG MAJOR COMPETITORS

	AT&T	IT&T	General Telephone	IBM	RCA	Western Electric	Westinghouse *	General Electric	MAJOR USERS	Exxon	General Motors	Citicorp
AT&T		4	2	22	3	7	9	14		1 / 8	2 / 13	1 / 20
IT&T	4		0	3	1	2	2	1		0	1	3
General Telephone	2	0		2	3	4	0	0		0	0	0
IBM	22	3	2		4	3	5	13		11	15	2 / 10
RCA	3	1	3	4		1	2	5		3	6	1 / 9
Western Electric *	7	0	4	3	1		1	5		1	7	7
Westinghouse	9	2	0	5	2	1		6		4	10	1 / 7
General Electric	14	1	0	13	5	5	6			5	15	1 / 11

* 100% owned by AT&T

The above chart was taken from the Senate Subcommittee on Reports, Accounting and Management's study of interlocking directorates. In boxes where two numbers are shown, the number of direct interlocks are shown in the upper right; the number of indirect interlocks appear in the lower left.

Communications Interlocks

As part of its study, the subcommittee focused on the telecommunications industry. While the staff uncovered no "direct interlocks" — situations in which two companies had a common director — among major competitors, the subcommittee found that such indirect interlocks as those between IBM and AT&T were "very significant" during 1976.

AT&T and IBM met each other on the 15 boards through 22 routes. Although there was no direct interlock between the firms themselves, IBM was directly locked to New York Telephone Co., the largest subsidiary in the Bell System, through their common director, Amory Houghton Jr., in 1976.

The study of the communications competitors showed RCA, "another participant in the battle," was indirectly interlocked with AT&T, once on the board of Citicorp and twice on the board of U.S. Steel. RCA directors also met IBM directors on the boards of Citicorp, Metropolitan Life and United States Steel, according to the subcommittee's report.

International Telephone and Telegraph (ITT), the second largest communications equipment maker, interlocked with AT&T on the Chrysler, First City Bancorporation, Southern Railway and U.S. Trust ITT interlocked with IBM three times.

The subcommittee found General Telephone and Electronics Corp. (GT&E), a smaller competitor of both IBM and AT&T, indirectly interlocked with those companies on the boards of Bankers Trust and Continental Oil. Also on the Bankers Trust board was a director of Western Electric, AT&T's wholly owned subsidiary, thus "providing additional strength to AT&T's position there," the study said.

'Summit Discussions'

Citicorp appears to have provided a rather full opportunity for summit discussions in the telecommunications industry," the staff stated. "On that huge international banking board sat the chairman of AT&T; the deputy chairman of General Electric Ltd; the chairman of Xerox Corp.; the chairman of Du Pont; a director of RCA; a director of CBS; a director of American Broadcasting Companies; a director of General Electric; directors of Sears, Roebuck and J.C. Penney; a director of Eastman Kodak; directors of General Motors and Ford; two directors of IBM; a director of Westinghouse; and a director of the New York Telephone Co."

As with communications competitors, major suppliers of communications services were also tied to AT&T and IBM. GE linked with AT&T through 14 director routes on 10 boards, for example. GE indirectly interlocked with IBM 13 times on eight boards, including American Express, Chase Manhattan, Chemical New York, Citicorp, J.P. Morgan, Scott Paper and Southern Pacific — "all very large and powerful companies.

"Such directorate routes could supply convenient conduits for possible private resolution of the public debate between monopoly and competition in the telecommunications industry," the subcommittee staff concluded. It also suggested in its study that AT&T and IBM had ample opportunity to influence their major users through boardroom participation.

For example, AT&T's boardroom "provided a convenient forum for discussion and possible agreement" among six of the nation's largest banking firms — Citicorp, Chemical New York, Manufacturers Hanover, Bank-

(Continued on Page 8)

Transnational data regulation

International Conference 28-30 November New York

European led data protection legislation is threatening the rights of US based multinationals to maintain control of their own administrative procedures.

The first major conference on the topic ever to to held in the USA will bring together the key authorities from Europe, representatives from international organisations, US government officials and businessmen.

Speakers include:

Prof. F A Bernasconi	Director-General, Intergovernmental Bureau for Informatics, Rome
Hugh Donaghue	Chairman, US State Department Advisory Committee on Transborder Data Flow
John Eger	Attorney at Law, former Director US Office of Telecommunications Policy
Jan Freese	Director-General, Swedish Data Inspection Board
Hans-Peter Gassmann	Head of Information, Computer & Communications Policy Group, OECD, Paris
Barry Goldwater, Jr.	Member, United States House of Representatives
Alden Heintz	Vice President, Tymshare Inc. USA
Frits Hondius	Directorate of Legal Affairs, Council of Europe
Oswald Ganley	Dep. Assistant Secretary, Department of State, Washington.
Louis Joinet	Ministry of Justice, Paris
G Russell Pipe	Independent Consultant, Amsterdam
Peter Robinson	Acting-Chairman, Computer Communications Secretariat, Government of Canada, Ottawa
Rudolf Schomerus	Office of Federal Data Commissioner, Bonn
Gerhard Stadler	Legal Advisor, Federal Chancellery, Vienna

+ 20 others

Phone John Eger in Washington for further information (202) 785 4837 or fill in and return the coupon to, Online Conferences Ltd., Cleveland Road, Uxbridge, Middlesex UB8 2DD, England. Tel: Uxbridge (0895) 39262.

Please send me a brochure giving full details of the 'Transnational Data Regulation' international conference.

Name Position

Organisation Phone

Address

DP Study Shows Extent of Corporate Interlocks

(Continued from Page 1)

Congress passed the Clayton Act following the investigation of J.P. Morgan and the "money trust" in 1913.

While the Clayton Act prohibits direct interlocks between competing industrial and commercial companies, the law does not cover the wide range of interlocks that have multiplied in the last 60 years. As a result of its inquiry, the subcommittee staff has recommended that Section 8 of the Clayton Act be amended to prohibit all types of interlocks between actual and potential customers, suppliers and sources of credit or capital.

123 of 130 Connected

The Senate subcommittee discovered 123 of the 130 firms studied were connected, on an average, with half of the other major companies in the inquiry.

In addition, the staff found the 13 largest corporations not only were linked, but accounted for 240 direct and 5,547 indirect interlocks, reaching an average of more than 70% of the other 117 companies.

The 13 largest corporations ranked by assets were AT&T, BankAmerica Corp., Citicorp, Chase Manhattan Corp., Prudential Insurance Co. of America, Metropolitan Life Insurance Co., Exxon Corp., Manufacturers Hanover Corp., J.P. Morgan and Co., Inc., General Motors Corp., Mobil Corp., Texaco, Inc. and Ford Motor Co.

The leading competitors in the automotive, energy, telecommunications and retailing fields met extensively on the boards of America's largest financial institutions, corporate customers and suppliers, according to the 1,000-page report entitled "Interlocking Directorates Among the Major U.S. Corporations."

For example, while direct interlocks between major competitors in the telecommmunications industry did not appear from the computer analysis, the subcommittee staff found significant indirect connections. Directors of AT&T saw IBM directors across the boardroom tables of 15 intermediate companies through 22 interlocking routes, the report said (see story on page 4).

In addition to its examination of concentrations in particular industries, the staff found the largest commercial bankers clustered on major insurance company boards and insurance directors joined on the banking company boards. "The boardrooms of four of the largest banking companies (Citicorp, Chase Manhattan, Manufacturers Hanover and J.P. Morgan), two of the largest insurance companies (Prudential and Metropolitan Life) and three of the largest nonfinancial companies (AT&T, Exxon and General Motors) looked like virtual summits for leaders in American business," the study said.

The subcommittee concluded that these patterns of interrelationships indicate an overwhelming potential for antitrust abuse and possible conflicts of interest that could affect prices, supply and competition and have an impact on the shape and direction of the American economy.

The use of the computer in this study marked one of the first times the Senate Computer Center has been asked by a subcommittee to assist in an investigation, James Estep of the center said.

The Computer Center performed all the programming for the subcommittee, using Computer Corp. of America's Model 204, an on-line programming package with its own hierarchical structure for data bases. Estep said the package proved excellent in tracking down indirect linkages between corporations.

The data base made up of the names of corporate directors of the 130 companies during 1976 was largely compiled by the subcommittee staff in the absence of current and complete corporate officer and director information from such federal agencies as the Securities and Exchange Commission (SEC), the Justice Department's Antitrust Division, the Federal Reserve Board and the Federal Trade Commission (FTC).

Estep said the initial programming for the project required the efforts of one person on the Computer Center staff for a period of less than three weeks.

The subcommittee hopes that, as a result of its study, Congress will pass legislation prohibiting interlocking directorates between corporations with more than $1 billion in sales or assets. This proscription should apply to all lines of business, including regulated and nonregulated enterprises, according to the subcommittee staff.

In addition to amending the Clayton Act, the subcommittee recommended that Congress legislate a "Business in the Sunshine Act" requiring open corporate board meetings that could be closed when trade secrets, privileged or special financial information and personnel matters are discussed.

The subcommittee would also like to see the public represented on the boards of large corporations. Regulatory agencies could force this kind of public participation in those industries they govern, the staff urged. These agencies should also collect and make public current and complete reports on interlocking directorships of companies under their jurisdiction.

The staff expressed its belief that "computerization is far enough advanced to provide a central and up-to-date source for that information."

When you install the

CA-DYNAM SOFTWARE TEAM

it's like adding more tape and disk drives!

Yes, CA-DYNAM/D and CA-DYNAM/T optimize the use of physical devices resulting in more productive use of your existing configuration.

In fact, IBM 360/370 users operating under DOS or DOS/VS systems have found that the CA-DYNAM Software Team can eliminate the need to purchase an additional tape or disk drive. Also, ease of operation and increased throughput make best use of your most important resource... people.

Disk Space and Catalog Management with CA-DYNAM/D

CA-DYNAM/D slashes disk space needs. It automatically allocates space for both permanent and temporary disk files on an "as needed" basis and it automatically releases unused disk space. Other features include:

- Device Independence
- Generation Data Sets
- Automatic Volume Recognition with Generic Volume Recognition
- BACKUP/RESTORE facility

Tape Library Control with CA-DYNAM/T

CA-DYNAM/T makes certain the correct tape reel is mounted and even provides for multi-file, multi-volume recognition.

- Automatic Volume Recognition and Early Device Release free-up your tape drives. A tape drive is only allocated from OPEN to CLOSE.
- Automatic release of tape work files
- Retention Control with a unique period ending facility

For more information and details of the free 15-day trial offer reply today!

MAIL THE COUPON OR CALL TOLL-FREE

800-221-4767

[NY State Call: 212-355-3333]

Member: Software Industry Association

COMPUTER ASSOCIATES

655 MADISON AVENUE
NEW YORK, NY 10021

U.S. OFFICES:
New York, California, Connecticut, Georgia, Illinois, Missouri, Ohio, Texas, Virginia

WORLD-WIDE DISTRIBUTION:
Australia, Austria, Argentina, Belgium, Brazil, Carribbean, Chile, Columbia, France, Germany, Holland, Indonesia, Israel, Italy, Japan, Mexico, Netherlands, Philippines, Scandanavia, South Africa, Spain, Southeast Asia, Switzerland, United Kingdom, Venezuela

☐ YES! Please rush the free CA-DYNAM TEAM Information Kit! cw 5/1/78

Name _____

Title _____

Company _____

_____

Address _____

City _____ State _____ Zip _____

Phone No. (_____) _____-_____ CPU _____ OP/SYS _____

Range of Software Serves Burroughs Additions

By Don Leavitt
CW Staff

DETROIT — Software capabilities offered by Burroughs Corp. for users of its recently announced B2800/3800/4800 processors (see Page 1) include the Master Control Program (MCP) operating system, various languages and utilities for on-line data entry, text editing, teleprocessing programming and on-line report generation.

An appropriate implementation of MCP, a broader range of languages, the Data Management System (DMS-II), Network Definition Language (NDL) and Message Control System (MCS) software will be available for the latest B6800 processors as well, a spokesman noted.

All of the processors being introduced now are object code-compatible with earlier systems, providing users with a "very smooth" upgrade path, he said. Many of the languages and utilities are now available across the Burroughs line so development started on machines at one level is transportable to those at other levels, he added.

One Environment

The MCP supports dynamic main memory allocation and management of the other system resources. Although the actual MCPs installed at the different levels of hardware differ in detail, they were all designed to give users essentially one operating system throughout the line, the spokesman said.

Cobol, Fortran, Basic and Burroughs Programming Language compilers are available as part of the bundled mid-range systems. Compilers supporting ANS Cobol '74 and RPG-II are also available to B2800/3800/4800 users as separately priced options.

The RPG compiler is said to be compatible with the one previously available for the B1800 and with IBM's RPG-II.

An On-Line Data Entry System (Odesy), described as a package that supports editing and validation procedures on multiple CRTs, is another mid-range offering that has been available on the B1800s. So is the On-Line Reporter package, which allows users to develop report generation and inquiry routines interactively and store them for later.

Text Management

The Command and Edit (Cande) language, previously available on the B1800 and the B6800, is said to be a CRT screen-based, on-line facility utilizing the B874 systems and communications processor to provide editing, manipulation and control of text-handling operations for the remote terminal user.

The Generalized Message Control System (Gemcos), announced as available on the enhanced mid-range systems, is another software package that has been available on the B1800 and is available for B6800 users.

Gemcos is a generator which creates user-level software for communications functions such as transaction routing, audit and recovery, concentration of messages and accumulation of network statistics, he explained.

B2800/3800/4800 users can also consider the Automated Documentation System (ADS), which assists in the on-line production of written documentation. It supports formatting, editing and final printout of textual material, according to Burroughs.

For the mid-range systems, RPG, Cande and ADS will be delivered late this year, Burroughs said. RPG will cost $50/mo; Cande, $1,760 or $60/mo; and ADS, $1,500 or $50/mo.

Odesy ($4,540 or $152/mo), Gemcos ($6,000 or $200/mo) and the On-Line Reporter ($1,000 or $33/mo) are scheduled to be available in the second quarter of next year.

Burroughs Gives B6800 Mid-Life Kicker

(Continued from Page 1)

four I/O processors (one per CPU), up to 16 data communications processors and up to 15M bytes of memory.

Code Compatibility

All of the B6800 models are object code-compatible with other B6000 and B7000 systems, the spokesman said, adding that the B6800s can be programmed in Cobol, Algol, Fortran, PL/I, Basic and APL. All reportedly utilize Burroughs' Data Management System, Network Definition Language and Message Control System software.

Each of the 6.7 MHz CPUs in the B6800 line comes with both an I/O processor and a maintenance diagnostic processor. The systems have a 300 nsec read access time for 6 bytes, and each of the machines, although not word-oriented, has a 60-bit word (48 information bits).

The B6808, with one CPU, 768K bytes of main memory, an I/O processor with 20 channels, an operator console with two operator displays and a maintenance diagnostic processor costs $425,000 and leases for $16,615/mo on a one-year lease the firm used as a base for all other lease prices.

The B6812, with 1.5M bytes of main memory and "all of the features of the B6808" plus optimized memory access logic, sells for $671,760 and leases for $25,000/mo on the one-year plan.

The dual-processor B6818, with two 768K-byte processors, includes two I/O processors with a total of 40 channels, one Global memory control with 768K bytes of Global memory, two operator consoles (each with two operator displays) and two maintenance diagnostic processors sells for $4,146,640 and leases for $35,700/mo.

The B6822, which includes all of the features of the B6818 plus optimized memory access logic, costs $1,400,160 and leases for $44,965/mo. Deliveries on all the large-scale offerings are scheduled for the third quarter.

Three- and five-year lease plans are also available.

Add-on memory comes in 768K-byte increments and sells for $120,000 with a lease price of $3,950/mo.

In other large-scale pricing action, Burroughs reported that purchase prices for the current B6807, B6811, B6817 and B6821 systems with "typical memory configurations" have been reduced an average of 18%, while lease rates "have increased slightly on the average."

Burroughs also announced its B6360 entry-level data communications subsystem for the latest B6800 models. It features a data communications processor with 24K bytes of local memory and eight data communications lines. The unit sells for $50,000 and leases for $1,569/mo.

Medium-Scale Systems

In the medium-scale range, the B2805 has a 3 MHz CPU and comes with 100,000 bytes of main memory that can be increased to a maximum of 500,000 bytes in 100,000-byte increments.

The B2805 costs $100,000 and leases for $2,640/mo. Memory increments sell for $20,000 and lease for $660/mo.

The B2835, which also has a 3 MHz CPU, comes with 125,000 bytes of memory. Its I/O subsystem includes integrated Data Link processors for the console, disk drives, printer, tape drive and card reader. The Data Link processors execute I/O commands independently of the CPU.

The Data Link processors also optimize the management of large data bases and terminal networks simultaneously with batch processing operations, the spokesman claimed, noting the B2835's I/O subsystem can accommodate up to 24 Data Link processors with an I/O transfer rate of 3M million byte/sec.

The B2835 costs $135,000 and leases for $3,625/mo. Additional 250K-byte memory increments cost $14,100 each and lease for $580/mo.

A basic B3805 consists of a 250,000-byte, 4 MHz CPU, an operator display console and integrated peripheral controls. Featuring a read access time of 500 nsec for two bytes, it sells for $175,000 and leases for $5,495. A 100,000-byte add-on memory increment sells for $30,000 and leases for $990/mo.

The B3845 also has a 4 MHz CPU. It comes with 500,000 bytes of memory, an operator display console and integrated Data Link processors. The basic system sells for $230,000 and leases for $7,690/mo. Add-on memory costs $28,840 for a 250,000-byte increment and leases for $1,045/mo.

The B4885 has a 500,000-byte, 8 MHz CPU. With an operator display console and integrated Data Link processors, it sells for $390,000 and leases for $12,750/mo.

Memory is expandable to one million bytes in 100,000-byte increments that sell for $30,000 and lease for $850/mo.

Initial deliveries on all of the medium-scale systems is scheduled to begin this month, the firm said.

Everything You Ever Wanted to Know About Computer Management

ANNOUNCING THE JUNE SOFTWARE SEMINAR SERIES FOR *MANAGEMENT.*

If you're responsible for the *management* of your system's performance and it's operations, you'll want to attend our one-day seminar on computer performance management, measurement and accounting.

During the fact-filled seminar you'll learn what it takes to get the most from your system.

From a management point of view, you'll learn about the facilities, available to aid you in measuring, accounting, tuning and controlling your complete hardware and software system.

You'll find out how to:

- **Forecast hardware/software needs**
- **Easily solve on-line and real-time problems, on-line**
- **Account for all hardware utilization**
- **Accurately budget, forecast and analyze trends**
- **Determine where optimization efforts will yield maximum return**
- **Provide management with a concise picture of computer workload**

Learn all of the facts on *total computer management* by attending the seminar in your area. Call and make your reservation today!

DATE	SEMINAR LOCATION
June 9	San Francisco --(415) 885-1888
June 14	Houston---------(214) 634-8400
June 15	Atlanta ----------(404) 577-8642
June 16	Cleveland-------(313) 569-3550
June 20	Chicago---------(312) 298-6520
June 21	New York City -(212) 868-1614
June 22	Rochester, N.Y. -(212) 868-1614
June 28	Boston ----------(617) 890-3288

Boole & Babbage, Inc.
510 Oakmead Parkway
Sunnyvale, Ca. 94086

In California: **408/735-9550**
Outside California, Dial Toll Free:
800/538-1872

Boole & Babbage

Member SIA SOFTWARE INDUSTRY ASSOCIATION

HELPING YOU GET THE MOST FROM YOUR SYSTEM

Contracts Not 'Afterthoughts'

Avoid Salesmen's Distractions, Report Warns

By Brad Schultz
CW Staff

WINTER PARK, Fla. — A DP vendor's sales representative may use a number of techniques to distract a customer from considering the fine points of a written agreement, treating a form contract "almost as an afterthought or, in the words of one marketer, an 'oh, by the way,' " according to *CNReport* Volume 1, Issue 12.

This ploy can be perpetrated by nearly any vendor but is most readily employed by large, well-known mainframers, the report said, indicating that a critical element in the ploy's execution is user faith in the vendor, usually generated by the latter's reputation in the DP community.

Downplays Agreement

A salesman might implement this strategy by downplaying the significance of the form agreement at every turn, even — if possible — neglecting to mention it during negotiations, the report noted. Examples include leaving the contract at the sales office, putting it "in preparation" or "in typing" and promising its delivery "next week."

A salesman might also make the agreement-signing event very casual, the report continued, explaining that he might tell his prospect, " 'I'll drop by at 10 on Monday to get your signature on the agreement'; or 'Why don't we play golf Saturday morning? That way I can bring the contract along for your signature and we can have the gear shipped Tuesday.' "

Further, a salesman might avoid furnishing his prospect's attorney or senior management with the form agreement for review prior to signing, or he might deliver it in advance, leaving out such important information as delivery schedules and maintenance obligations, *CNReport* said.

Other techniques for applying this strategy, according to the report, include presenting the form agreement to a user at the point when his sense of urgency is keenest or when his faith in the vendor is "maximized," and neglecting to offer a copy of the contract to the user after he has signed it.

This ploy is valuable to vendors because it enables them to avoid the problems associated with long, drawn-out contract negotiations, the report said, explaining users may adopt a tougher stance or back out completely as deliberations begin to drag.

The ploy also lets the vendor use its own standard form agreement, which is "almost always an artfully worded document designed to give maximum protection to the vendor and minimum protection to the user," the report said.

Further, the ploy allows a vendor salesman to accentuate the effects of his hype rather than the negative qualities of the agreement, the report noted.

CNReport recommended that users follow four rules in countering this vendor ploy:

- Obtain copies of all relevant vendor contracts, supplements and schedules at the time negotiations begin.
- Have the contract thoroughly reviewed by all members of the negotiating team before the negotiations begin.
- Have the legal staff review the agreement and prepare all necessary changes and additions, or an alternatve agreement, as far as possible in advance of the proposed signing.
- Avoid being rushed into signing *anything* without adequate review by legal counsel.

The annual U.S. and Canadian subscription rate for *CNReport* is $195, and single copies cost $20, according to the report's publisher, International Computer Negotiations, Inc., P.O. Box 364, Winter Park, Fla. 32790.

DPMA Planning Meet on Impact Of Privacy Laws

CHICAGO — Experts on the practical impact of privacy legislation will participate in a 1-1/2 day conference sponsored by the Education Foundation of the Data Processing Management Association (DPMA) on June 22-23 at the Hyatt Regency O'Hare Hotel here.

The impact of privacy legislation on information processing at the federal and state levels and on business and the individual citizen will be discussed, according to Edward J. Palmer, DPMA executive director.

Conference moderator will be J.T. Westermeier Jr., member of the law firm of Arent, Fox, Kintner, Plotkin and Kahn of Washington, D.C., who has written extensively on the privacy issue.

Admission to the conference is $125 for DPMA members and members of DPMA provisional special interest groups and $155 for nonmembers. The $30 differential may be applied toward DPMA membership dues for those seminar registrants who apply for membership within 90 days of the seminar, the DPMA said.

For a registration form and other information contact Carol Harte, conference coordinator, DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

OPTIMIZER III Eliminates program problems before it's too late.

From Capex, a dramatic new approach to COBOL programming.

Programs that apparently have been thoroughly tested sometimes fail... unpredictably and unexpectedly. And for most programs, there is never a "good" time to fail.

That's where Capex can help, with an exciting new program product we call OPTIMIZER III. If you use COBOL and any of the IBM OS, VS1, SVS or MVS operating systems, OPTIMIZER III can help you produce more reliable, more efficient systems, on time, at lower cost.

Improves Program Reliability

OPTIMIZER III works directly with each COBOL programmer, providing direct feedback about what the program *actually* does. Concise, easy-to-use information is provided right on the source program listing to help spot otherwise hidden logic or performance problems and to highlight untested logic. Using OPTIMIZER III, problems are found and corrected *before* programs go into production so there are fewer failures, fewer missed production schedules, fewer reruns.

Speeds Problem Diagnosis

OPTIMIZER III helps minimize the impact of program failures. It "traps" program failures, analyzes them, and then provides the information needed to diagnose the problem. Whether programs are in development or in production, problems can be diagnosed quickly, directly by COBOL programmers, using OPTIMIZER III's COBOL-oriented diagnostic information instead of cryptic hexadecimal dumps. Problems are corrected faster, lost time is minimized, and reliance on special support groups is reduced.

Better Programs Faster

By providing key information in a highly usable form, new OPTIMIZER III works with each COBOL programmer to produce more reliable, more efficient programs. It provides the information needed to speed program debugging and ensure adequate testing. Programs are developed faster, with fewer compiles, fewer test shots. Printed output for listings, dumps is reduced. And, thanks to proven automatic object program optimization, all programs produced with OPTIMIZER III are smaller and faster, *automatically.*

Results Available Immediately

With OPTIMIZER III, you get better program quality, more programming capacity, more system capacity. And you get them *immediately.* Without changing systems. Without costly retraining. Without increasing cost. You can have new OPTIMIZER III working for you literally in a matter of minutes. To find out how, write or call now: (602) 264-7241.

CAPEX CORPORATION
Atlanta (404) 261-3553 • Boston (617) 329-6170 • Chicago (312) 596-6550 • Dallas (214) 238-7191 • Los Angeles (213) 923-9216 • New York (201) 262-8888 • Other offices worldwide.

capex CORPORATION

Capex Corporation
2613 N. 3rd St., Phoenix, AZ 85004

Gentlemen:
Please send me more information on OPTIMIZER III.

Name
Title
Company
Address
City
State Zip
Phone
Model
System ☐MFT ☐MVT ☐VSI ☐SVS ☐MVS

CJ

User Puts Stamp of Success on Electronic Mail

(Continued from Page 1)

America and more than 20,000 miles in Europe.

The company, based here, is a highly diversified supplier of energy equipment and building materials. Its data center in Windsor, Conn., includes a 470V/6 from Amdahl Corp.; a Cyber 172 and a 7600 from Control Data Corp.; and a pair of PDP-11s from Digital Equipment Corp. along with the 168.

Test Going Well

Combining the query capabilities of the inquire package from Infodata Systems, Inc. with the editing and teleprocessing support of TSO, Atom was made available to a small test group in early December. The group chosen was the DP management team, but not because of its knowledge of DP, Levy said.

The choice was made because Levy wanted to exercise the system as much as possible. To do that, he needed a group with a commonality of interest and a need to communicate frequently both up and down — through levels of management — and across — between peers.

Atom currently addresses only the "in/out basket" portion of the electronic mail processing spectrum. Although Inquire supports text search and CE has put together coding for the archiving and filing of messages sent electronically, Levy deliberately chose not to implement such a facility in the Atom system.

Users could encounter tremendous problems, he explained, if at the end of the pilot project the entire system were withdrawn and they had no hard copies of correspondence received or sent.

Generally speaking, however, Atom is going well. People work with terminals at home at night and over weekends and they take portable units with them on trips in order to keep in touch with the organizations.

People would probably use it a lot more in normal office environments if CE could find a good word-processing system to front-end the electronic transmission of messages. A word processor would allow an executive to dictate a draft, have it typed into the system and in hard copy for review, corrected and on its way.

That's the goal, but so far Levy hasn't found a word processor that handles the final stop — transmitting the final corrected text to a host CPU. A local word processor would not only make the executive and the secretary more comfortable, it would free the communications lines of all editing traffic.

The Atom-based pilot system will probably stay in place into September, Levy estimated, but what happens after that is still undecided.

IBM, AT&T on 15 Boards

(Continued from Page 4)

ers Trust, Continental Illinois and Western Bancorporation.

In addition, General Motors, Chrysler and Caterpillar Tractor represented the automotive industry on the AT&T board; Exxon and Mobil appeared on the firm's board for the energy industry; and J.C. Penney, Montgomery Ward and Federated Department Stores made up the AT&T board's retailing contingent, according to the subcommittee report.

The senate study's computer printouts showed AT&T was directly interlocked with Texas Instruments, Inc. two years ago. The study also indicated the boardrooms of the nation's largest financial corporations provided a convenient meeting ground for major competitors in the computer industry.

While Honeywell, Inc., IBM, Sperry Rand Corp. and Hewlett-Packard Co. do not appear to have been directly interlocked during 1976, directors from each of these firms met regularly on the board of Chase Manhattan. At those meetings, James H. Binger of Honeywell, Patricia R. Harris — then an IBM director, now secretary of the U.S. Department of Housing and Urban Development, William R. Hewlett of HP and Norma T. Pace, a director of Sperry Rand, also encountered Juanita M. Kreps, then a director of Western Electric and now secretary of the U.S. Department of Commerce.

In addition to its indirect competitor and direct user connections, IBM also appears to have had a direct hand in the affairs of the press during 1976. Now Secretary of State Cyrus R. Vance, then an IBM director, also served on the board of the New York Times Co.

IBM's vice-president and general counsel Nicholas DeB. Katzenbach was a member of the computer industry leader's board while he acted as a director of the Washington Post Co.

Two Trials Differ in Style

(Continued from Page 2)

tors.

In San Francisco, Judge Samuel Conti reigns in a far more relaxed atmosphere. He often enters the courtroom, robes flying, before his clerk has a chance to announce him, and confers with the lawyers about procedural matters casually in open court. Edelstein almost always holds such unstructured discussions in the robing room, out of public view.

Conti constantly jokes with the attorneys and sits through the proceedings with a bemused smile. His major concern appears to be in expediting the trial as much as possible. If a problem arises, he generally tells the attorneys to come to an agreement outside of court.

Of course, Edelstein may not often use that approach because it does not often work: The government and IBM have rarely come to an agreement about anything outside of court.

IBM: No Move to Dismiss

(Continued from Page 1)

There have been 52 witnesses whose time on the stand ranged from half a day for Dr. Philip Morse of MIT to 78 days for Dr. Alan K. McAdams, the government's chief economic advisor for this case.

Judge David N. Edelstein, the sole arbiter in U.S. vs. IBM, handed down several opinions as the government's case ended. He denied IBM's motion for a mistrial [Jan. 9] as being "totally without merit" and he refused to allow the firm to reopen discovery, which would have meant interrupting the trial [March 27].

Edelstein granted a government motion to conduct depositions of 47 IBM witnesses and he signed a stipulation allowing IBM to drop 58 of the 70 user witnesses it had scheduled; the parties had agreed the testimony of any more than 12 would have been cumulative.

The end of the plaintiff's case signalled a changing of the guard on the government staff. Lead attorney Raymond Carlson, who was eligible for retirement last fall, stepped down from the command post and was replaced by Robert Staal.

University Thief Very Selective

(Continued from Page 1)

CPU, serial no. 4201.

- A DEC PC04 tape reader, serial no. 458.
- A Kennedy Co. 9000-9 RAW tape drive, serial no. 510-804.
- A Kennedy 9217 formatter, serial no. 510-499.
- A Remex RRF1150 BCI/651 tape reader, serial no. 37766.

The institute is posting a $500 reward for information leading to apprehension of the thief and another $500 reward for information leading to recovery of the equipment. Rubin said he can be reached at the institute by dialing (203) 486-4716 or 486-4622.

JES3/MVS

Customized self-study/ live lecture courses.

CSR reduces training costs: All in house self-study and live lecture courses are customized to reflect your installation's operating standards. CSR eliminates travel expenses and student study time, thus reducing over-all JES3/MVS training costs.

CSR training is complete: CSR's self study machine exercises simulate actual operating conditions for your configuration. The courses satisfy the training requirements for twelve job functions including management, operations, systems and application programmers.

CSR is proven: Many major companies have used CSR to provide JES3/MVS training, including:

- International Harvester
- Manufacturers Hanover Trust
- Nationwide Mutual Life Insurance
- Pacific Northwest Bell
- American Airlines
- Montgomery Ward
- Phillips Petroleum
- SwissAir

For additional information fill out coupon below or contact Mike Daversa at:

CSR
COMPUTER SYSTEMS RESEARCH, INC.
195 West Main Street, Avon, Ct. 06001
tele. (203) 678-1212

Please send additional information:
Name.....
Company.....
Address.....
City.....State.....Zip.....
Send to CSR, 195 W. Main St., Avon, Ct. 06001

Proposal Book Rocks Industry!

A California publishing firm has literally taken the computer industry by storm with a recently-published "how-to" proposal book. The book, a 4½ pound loose-leaf volume entitled *How to Create a Winning Proposal*, covers every aspect of proposal preparation from start to finish, including the nuts-and-bolts details on how a winner is put together.

Written by two top West Coast proposal consultants, *Winning Proposal* is rapidly becoming the standard text for use in commercial, government and OEM proposal efforts. It is currently in use by 74% of the major data communications equipment manufacturers in the nation and 58% of the EDP management and service organizations.

Using a step-by-step instructional technique, the authors provide a virtual roadmap to the entire proposal process . . . including section-by-section checklists to ensure the proposal team of covering all the important bases. Excellent guidelines are given on the contents, structure and methods of preparation for both solicited and unsolicited proposals. A tactical approach is used for developing an effective "win strategy," mobilizing the proposal team, and controlling the input of the various team members. Detailed instructions on how to analyze and respond to RFP's, RFQ's, and IFB's are included.

Copies are available from Mercury Communications Corp., 730-CW Mission Street, Santa Cruz, CA 95060. $65 (pre-paid) includes 3-5 day delivery inside USA. In Calif. add $3.90. For outside USA, U.S. $76 (Int'l money order) includes air delivery. To order C.O.D. call 408/425-8444.

So Manuals Can Be Simplified

GM Program Rates Level of Text Difficulty

By Howard A. Karten
CW Staff

DETROIT — Has your car's mechanic been getting better lately?

The General Motors Corp. (GM) here is trying to help him by using an analysis system to measure the readability of its publications, including GM shop manuals, dealer service procedures and warranty and owner's manuals.

A computer program called Simple Test Approach for Readability (Star) was born five years ago, the company said, when a group of GM divisional service representatives discovered a fact that was well-known to others: shop manuals were difficult for mechanics to read and understand.

The concept of readability was developed in the 1940s by Rudolph Flesch and involves counting the number of words, sentences and syllables in written text. To apply a computer to this task, GM wrote a program for its Honeywell Information Systems, Inc. 6000, using Basic. The program reads text and then produces statistics showing the number of sentences, words and syllables, the average sentence length, the number of syllables per word and an overall index of difficulty. If it is felt that these are too high, the text is revised manually.

Studies over the years have indicated that most people feel most comfortable reading material written on the ninth- to 11th-grade level, according to GM engineer Richard Jilbert, so simplifying the material is not an insult to the mechanics' intelligence. Many classics of American literature, such as *Robinson Crusoe*, and *Tom Sawyer*, are written at about the seventh-grade level, he added. In addition, comprehension is a function of the way words are attached to each other and not simply a function of the reader's capabilities.

A study of the shop manuals published by GM showed they were written at or above the 12th-grade reading level; about half of the mechanics using them read, on the average, at an eighth-grade level, according to GM. These levels, combined with the technical nature of the manuals, meant that half their intended audience got only limited use from them.

GM gave the following example of a text it revised after the Star analysis. The original read: "If your vehicle is equipped with a stowaway spare tire, your spare is designed to provide you with more usable interior space. The spare is located in a deflated condition resulting in a reduced overall diameter." After rewriting, it read: "If your car has a stowaway spare tire, your spare provides you with more usable storage space since it is stored deflated."

Since developing Star, GM has applied it to other publications. An early test of memos taken from GM's Opel Division in Germany showed they were very difficult to read.

Since the concept behind the Flesch index is applicable to all forms of written text, any organization that produces written material for wide use can use Star. GM has made the program's text available free to anyone wishing to use it. Copies can be obtained by writing to the GM Public Relations Staff, 3044 W. Grand Blvd., Detroit, Mich. 48202.

Santa Cruz Sets Summer Courses

SANTA CRUZ, Calif. — The University of California Extension here is offering its eighth annual Institute in Computer Science from July 10 through Aug. 11.

The program will consist of six courses in programming methodology, data base management systems, operating systems, the design and analysis of algorithms, compiler construction and computer graphics.

The principal emphasis of the program will be the "professional increment," according to a spokesman who explained this means a highly trained computer professional should gain from the institute something new and useful.

The prototype course on compiler construction will include two weeks of intensive instruction and practice, during which time students will write and exercise their first compiler.

Courses range from $425 to $600 each. Further information is available from Joleen Kelsey, University of California Extension, Carriage House, Santa Cruz, Calif. 95064.

How to increase productivity in a COBOL shop...for $25

When you think of it, the programming done in most COBOL shops is pretty haphazard. In general, programs are coded without ever being designed so they have no structure. Program documentation (if any) is likely to be incomprehensible. Few programs are coded in an understandable style. And testing and maintenance are often a shambles.

As you would expect, these practices are reflected in programmer productivity. In a study done in 1965, for example, the average COBOL programmer was shown to produce only 10 to 12 lines of tested code per day. What's worse, a study done in 1975 showed no improvement. In other words, we have been stuck for ten years at an incredibly low level of productivity.

Since the mid sixties, however, the techniques of structured programming have promised a way to improve productivity. In one experiment, for example, programmers who used structured programming produced from 35 to 65 tested lines of code per day. That's a 300 percent or more increase when compared with the results of unstructured projects. Another study showed an increase in productivity of 77 percent or more when the techniques of structured programming were used.

"Your book is by far the most readable and instructive book on structured programming that I've read—and I've read them all."

Unfortunately, few companies today are benefiting from structured programming. Only about one-fourth of the computer installations claim to be using the techniques of structured programming. And I know that many of these companies use the techniques far less than they would care to admit...and with results that they couldn't brag about. In short, though the theory promises much, no one yet has developed a practical method for applying the theory.

With this in mind, I'm happy to announce two books on structured programming that I think will have a major effect on programmer productivity. The first is a training textbook called *Structured Programming for the COBOL Programmer*. The second is a reference manual called *The Structured Programming Cookbook*. Both were developed by Paul Noll, who is a software specialist and training manager for a large company in San Francisco.

What the Textbook Does

Like other books on structured programming, Paul's textbook presents the theory behind the structured programming movement. Unlike other books, however, Paul's book presents a method for applying the theory that works...a method that is complete, logical, and practical.

Perhaps the major shortcoming of other books and courses on structured programming is the treatment of program design and documentation. In general, these subjects are either given academic treatment or are omitted altogether. In contrast, Paul gives specific guidelines for designing and documenting programs with the emphasis on practicality. As Paul says, "It's ridiculous to try to teach structured coding and testing without first teaching structured design and documentation."

In chapter 2, then, you'll learn how to design a structured program. You'll learn the four steps for creating structure charts...what modules should go at what level...six things to watch for when refining structure charts...and much more.

In chapter 3, you'll learn how to document the modules within the structure chart using HIPO documentation. Why HIPO? Because Paul feels it is the most effective form of documentation that is currently available and it is the one most likely to be around ten years from now. But Paul doesn't use the cumbersome IBM implementation of HIPO. Instead, he shows you how to use an efficient HIPO subset.

After you have mastered structured design and documentation, chapters 4, 5, and 6 show you how to use the other techniques of structured programming. These techniques include structured coding, top-down testing, structured walkthroughs, chief-programmer teams, and development support libraries.

What the Cookbook Does

One of the problems with training is that it too often isn't applied after the programmer returns to his job. That's why we created an easy-to-use reference book that will follow the programmer back to his desk.

Section 1 of this book is called Standards and Guidelines. It summarizes the principles of the text for each phase of program development. So if a programmer can't remember the six steps to follow when creating a HIPO diagram or how to use compound conditions in a COBOL IF statement, he can use the cookbook to refresh his memory in a hurry. From the manager's point of view, this section is an instant standards manual for a structured programming shop.

"Mr. Noll has written a straightforward, no-nonsense text which tackles head-on the problems of proper program design when writing a structured COBOL program."

Sections 2 and 3, however, are a more important aid to productivity. They present the complete solutions for four model programs. Since structured programming encourages you to develop similar programs in similar ways, this means that you won't have to develop each new program that you write from scratch. When Paul Noll develops an update program, for example, he finds that he can use the structure chart, some module documentation, and even some of the COBOL code from the model update program in the cookbook. Imagine how this can increase a programmer's productivity.

Our Unlimited Guarantee

Together, I think Paul Noll's text and cookbook can have a major effect on the productivity in a COBOL shop. In six chapters in the text, Paul presents a complete system for developing structured programs. In three sections in the cookbook, he has created a tool kit for the COBOL programmer. At $25 for the pair, you don't need much programmer improvement to justify this investment. And this could be the most important purchase you will make this year.

But don't take my word for it. So there's no risk to you, all our books are sold with an unlimited guarantee. If you ever feel that they aren't effective, you can return them for a prompt refund...no matter how many books you buy, no matter how long you've had them.

So order a set of books today. There's no risk to you. And there's so much to gain.

Mike Murach & Associates, Inc., 4905 North West Avenue, Suite 102, Fresno, California 93705

Gentlemen: Please send me the books indicated below. I will take up to 30 days to review them, and I will hold you to your guarantee. If the books aren't effective, I will return them for a full refund at any time. I understand that I will be billed the appropriate price for each book ordered plus freight (and sales tax in California).

Quantity	Book	Unit Price	10 or More	25 or More
_____	Structured Programming for the COBOL Programmer	$15.00	$13.75	$12.50
_____	The Structured Programming Cookbook	10.00	9.00	8.00

Name and Title _____

Company _____

Address _____

City, State, Zip _____

Seek Cost-Effective Process

Energy Researchers Simulate Coal Gasification

By Ann Dooley
CW Staff

PALO ALTO, Calif. — Researchers at the IBM Scientific Center here are using computer simulations of the coal gasification process in an effort to help relieve the country's energy shortage.

Coal-generated gas, once a common source of energy, fell out of use because it proved too expensive compared with cheaper and cleaner petroleum. But with modern technology, researchers hope to find more efficient and cost-effective methods for coal gasification as an energy alternative.

The gasification process calls for raw coal to be released through a coal lock into the gasifier, where it is blasted by a combination of steam, oxygen and air. Ash is filtered out and the raw gas produced is purified before being used in gas turbines or burned to create steam for steam turbines. The turbines then turn the power generators.

"We're creating a mathematical model in the computer of the physical and chemical processes that take place in coal gasification," Dr. Louis Lopez, manager of process analysis and project manager at the IBM center explained.

Operating Conditions Studied

The system creates simulations that can be used to study the effects of changing certain operating conditions within the gasifier, Lopez said. Once these effects have been discovered, researchers can design better processes and operate them more efficiently, he added.

Before the study can really achieve results, it is necessary to come up with the right mathematical equations, he noted.

Variables Analyzed

Coal has different compositions, so it must be analyzed for its content and heating value. Once these factors are known, researchers can analyze other variables such as the size of the particles, how the coal reacts to stress and how much air, oxygen and steam must be added to create the desired gas.

Researchers must also determine the best way to remove sulfur from the coal.

Every factor must be tested against every other one, Lopez noted. "If we put in the air, steam and coal at such a rate and temperature, we must then analyze how each of the elements react given that certain set of circumstances," he explained.

Data from actual coal gasification tests and operations is entered into the IBM 370/145 the researchers use to construct the mathematical models. "We take the real data and build from that to predict how an actual device will operate," Lopez said.

The completed computer model will be extremely detailed and mathematically sophisticated so it will be able to consider all the necessary factors and alternatives. Then it will be possible to ask "what-if" questions and make some predictions, Lopez said.

FDR-DSF
2000 USERS

Fast Dump Restore
- Dump/Restore Full Volumes
- Diagnostic Processing

Data Set Functions
- Dump/Restore up to 250 Individual Data Sets
- Restore Data Sets from FDR Full Volume Backups

Volume and Data Set Level Password Protection
Performance — Reliability

Supporting
2314 • 3330-1 • 3330-11
3340-35 • 3340-70 • 3344 • 3350

1975 datapro HONOR ROLL
1977 MEMBER datapro SOFTWARE HONOR ROLL
1976 datapro HONOR ROLL
OVERALL SATISFACTION · THROUGHPUT · EFFICIENCY · EASE OF INSTALLATION · DOCUMENTATION · VENDOR SUPPORT

For further information or Free 30-day Trial, call or write to:

INNOVATION DATA PROCESSING

970 Clifton Avenue, Clifton, NJ 07013 • (201) 777-1940

Book Outlines Job Offerings In DP Industry

NEW YORK — The minicomputer industry explosion will create hundreds of thousands of new job opportunities in the near future, according to Herman McDaniel, whose book *Careers in Computers and Data Processing* describes more than 100 occupations in these fields.

According to the publisher, the book was written "to answer the questions of students who are considering this expanding and high-salaried field." Among the areas of interest are systems design, testing and production, sales and installation, operation and operational support, programming, systems analysis, keypunching, auditing and maintenance.

Qualifications Outlined

The book includes descriptions of the duties and responsibilities of each job and explanations of the training and education needed to qualify for them, the publisher said. In addition, the author discusses the traits and interests desired by employers and tells where the jobs exist in the public and private sectors.

The 188-page book is available for $10 (cloth edition) or $7.50 (paper edition) from Petrocelli Books, Inc., 384 Fifth Ave., New York, N.Y. 10018.

Exchange Started For Banking DP

NEW YORK — The Banking Systems Information Exchange (BSIE) has been formed by a group of systems professionals here to provide a forum for discussing bank-related DP topics.

Founders come from Bankers Trust Co., the Chase Manhattan Bank, N.A., Chemical Bank and Manufacturers Hanover Trust Co.

Requests for information should be addressed to BSIE at Manufacturers Hanover Trust Co., 39th Floor, 55 Water St., New York, N.Y.

Monthly Examines Value of Arbitration Clauses

By Marguerite Zientara
CW Staff

BOSTON — When drawing up a contract with a hardware or software vendor, one should consider carefully whether to include a clause saying that in case of a dispute the parties will commercially arbitrate their differences under the rules of the American Arbitration Association, according to the April newsletter *Computer Law and Tax Report.*

The newsletter introduces the pros and cons of arbitration as defined by Lane McGovern of the Boston law firm Ropes and Gray in an article for *Idea,* published by the PTC Research Foundation of Concord, N.H.

McGovern pointed out that whereas arbitration originated as a method of settling disputes between merchants and buyers about the quality, weight or delivery of commercial products, commercial arbitration is now being applied to licensing agreements, stockholder disputes, business acquisitions, leases and distributorships.

While the advertised advantages of commercial arbitration are speed, economy and justice, McGovern noted, the dollar stakes are substantial, the risks to each party are great and, except for cases of corruption or fraud, it is unlikely there will be judicial review of the arbitrator's decisions.

Further dangers in commercial arbitration are that the arbitrator may not have any useful expertise in the area and will probably have limited experience as an impartial judge, McGovern said. The arbitrator not only does not have to follow court rules of evidence, he also does not have to follow the substantive rules of law that apply to contracts.

Self-Tailored Remedies

McGovern pointed out that the arbitrator can fashion his own remedies, as opposed to using those authorized by the legislatures and court custom. Finally, he noted that the arbitrator does not have to say how the decision was reached.

In spite of these dangers, McGovern feels there is a place for commercial arbitration, since it offers a method of resolving disputes without the formality and bitterness of a court hearing.

Arbitration Requirements

To protect the parties to a contract, McGovern suggested including in the arbitration clause a requirement that the arbitrator be knowledgeable in the DP area. He also suggested there be a requirement that the arbitrators decide "according to the law" and that a lawyer be a member of the arbitration panel. Other suggested requirements are that the testimony be transcribed and the decision be accompanied by findings of fact and a statement of reasons for the decision.

McGovern pointed out that in the labor relations field, for example, arbitrators have been setting forth in writing the facts and reasons for decisions for years. While the parties will have to pay more for an arbitrator who undertakes these added responsibilities, they can still get quick justice without forfeiting many of their rights to appeal against injustice, McGovern noted.

Computer Law and Tax Report has a subscription price of $48 per year. It is published monthly by Warren, Gorham & Lamont, Inc. 210 South St., Boston, Mass. 02111.

Job Survey Sees Operators Up, Punchers Down

WASHINGTON, D.C. — The employment outlook for console and peripheral equipment operators is expected to rise about as fast as the average for all DP occupations, while jobs for keypunch operators will continue to decline, according to the U.S. Department of Labor's "1978-79 Occupational Outlook Handbook."

As with analysts and programmers, the trend of small businesses operating their own systems and the increased use of direct data entry techniques will reduce the demand for operators [CW, April 17].

Statistics show 565,000 persons worked as console, auxiliary and keypunch operators in 1976. These workers were employed in every industry but especially in the insurance sector and in firms that provide DP services for a fee.

This occupation does not require as specialized a background as the other professions. A high school education is important, but on-the-job training is the most likely way to learn the work, according to the handbook.

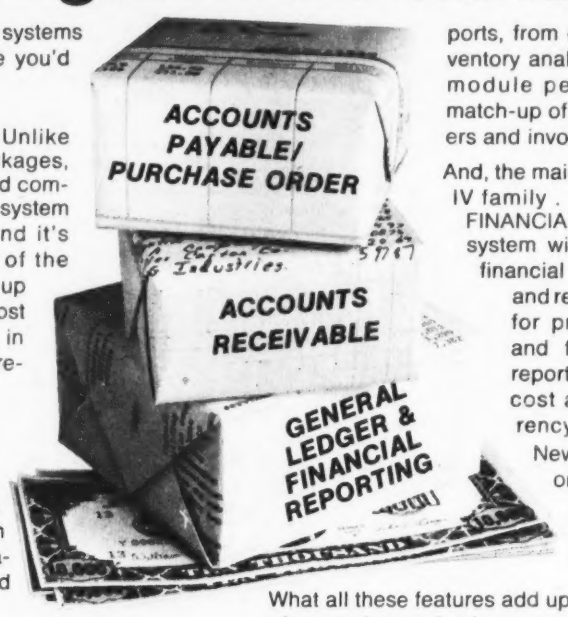
Average weekly earnings of keypunch trainees ranged from $120 to $140 a week in private industry, according to the Department of Labor. The weekly earnings of begining console operators averaged about $150 weekly. Experienced workers' salaries ranged from $205 to $215 and lead operators earned $230 to $260 weekly.

Inexperienced console and keypunch operators started at $126 a week in the federal government, where the average salary in 1976 was $245 for console operators and $160 for keypunch operators.

Throughout the economy, console operators earned slightly more and keypunch operators earned slightly less than the average earnings for all nonsupervisory work in the private sector.

Want a faster, cleaner, user-oriented financial application system? ACCOUNTING IV®...right off the shelf and right on the money.

A lot of off-the-shelf accounting systems can make you wish that's where you'd left them . . . on the shelf.



But not ACCOUNTING IV . . . Unlike other financial application packages, ACCOUNTING IV is as flexible and comprehensive as a custom-built system costing five times as much. And it's easy-to-use — requires none of the special programming that ties up valuable DP time and makes most packaged systems unduly slow in getting information back to the requesting party.

There are four members of the ACCOUNTING IV family — each providing smooth integration with existing programs, each written totally in ANS Cobol, and each boasting a wealth of unique features that makes it easy to install and easy to adapt to the user's needs.

ACCOUNTS RECEIVABLE, for example. A fully integrated module providing tight monetary controls, a wide range of billing options, and complete automation of every receivables function. Over 25 management reports available to suit the user's requirements. Everything from detail aged A/R to sales analysis by product.

Or ACCOUNTS PAYABLE. An extremely flexible system offering more than 50 statistical and informational reports, from check reconciliation to inventory analysis. The Purchase Order module performs the three way match-up of purchase orders, receivers and invoices.

And, the mainstay of the ACCOUNTING IV family . . . GENERAL LEDGER & FINANCIAL REPORTING. A powerful system with a broad data base for financial and statistical collection and reporting. Offers capabilities for profit-planning, budgeting and forecasting, responsibility reporting, transaction analysis, cost allocation, multiple-currency accounting, and more. New enhancements include on-line data entry and inquiry as well as interfaces to TOTAL, IDMS, DL/1 and IMS data bases.

What all these features add up to is an entirely new level of control over business operations. A strong claim? Yes, but one that over 250 companies have already seen us make good on.

So contact Informatics today and let us show you how in as little as four weeks you can be up and running with an accounting system that's right off the shelf and right on the money.

ACCOUNTING IV is sold and supported by Informatics Inc., the world's largest independent software vendor.

informatics inc Software Products

World's Leading Independent Supplier of Software Products

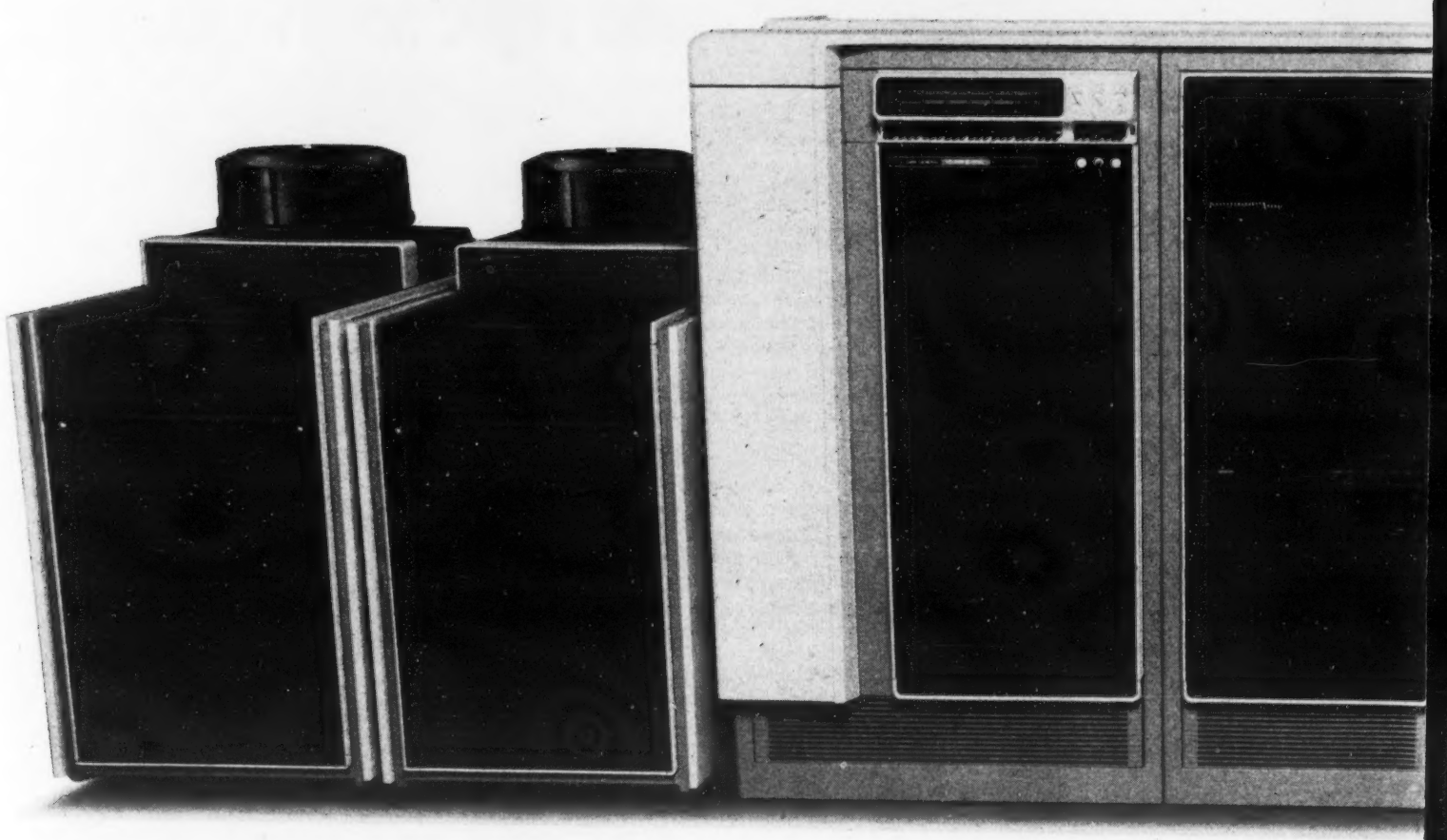
Member SIA Software Industry Association

Informatics Inc., Software Products
21050 Vanowen St., Canoga Park, Calif. 91304 (213) 887-9121

Please send literature on:
☐ General Ledger & Financial Reporting.
☐ Standard Product Cost.
☐ Accounts Payable. ☐ Accounts Receivable.
☐ I would like to attend a free ACCOUNTING IV seminar. Please send dates and tell me when the next seminar will be in my city.

Name_____
Position_____
Dept._____ Computer_____
Firm_____
Address_____ Tel._____
City_____ State/Province_____ Zip_____

INTRODUCING THE MINI-MAINFRAME. $195,000.



Data General Corporation, Westboro, MA 01581, (617) 366-8911. Data General (Canada) Ltd., Ontario. Data General Europe, 61 rue de Courcelles, Paris, France, 766.51.78. Data

Until now, either you opted for the capability of a mainframe or you went with the flexibility and economy of a mini. Until now.

Introducing the Data General ECLIPSE M/600 computer system. It combines the workload capability of a mainframe with the traditional advantages of a mini, such as interactive computing, distributed processing and economy.

One thing that makes the ECLIPSE M/600 like no other existing computer is an incomparable three level I/O Management System, which prohibits I/O bottlenecks. Another is an incredibly efficient Demand-Paged Memory Management, which allows you to run more jobs faster. And its new Job Processor is unmatched for speed and flexibility. Then our supremely intelligent Advanced Operating System (AOS) keeps everything speeding along for a minimal terminal response time and a maximum concurrent batch stream throughput.

Once again Data General raises the world's expectations for computers, while lowering the cost. To find out more about what you can expect from the new ECLIPSE M/600, write for our brochure. Or call (617) 366-8911, Ext. 4735.

Data General

We make computers that make sense.

General Australia, (03) 89-0633. Data General Ltda., Sao Paulo, Brazil, 543-0138. © Data General Corporation, 1978. ECLIPSE is a registered trademark of Data General Corporation.

Dangers Seen in Corporate Planning Trends

By Don Leavitt
CW Staff

ST LOUIS — Fundamental improvement in corporate planning will occur only when we gain a deeper understanding of what corporate planning is and how it functions in the life of an organization. Certainly the current emphasis on computer-based modeling avoids many issues that should be faced, according to the keynote speaker at the recent meeting of the Planners League.

"The general trend today in management at all levels and in all areas is dominated by the system paradigm, by the idea of control through making explicit and quantifying every key variable and relationship that figures in the organizational equation," Dr. James S. Williamsen said.

"Should this domination become a widely accepted and desired goal for society, the Orwellian future — '1984' — may be the ultimate result," the director of methods and planning for L.D. Schreiber Cheese Co. warned.

"In such a world, corporate planning — armed with the technologies developing today — will be adopted to fit the control-oriented objectives of the society generally. The free economy disappears along with other, more basic freedoms," he said.

"Society becomes a totally controlled system; corporations become subsystems dedicated to supporting the whole in some very specific way. The corporate planners become the guardians of subsystem stability and anticipators of unwanted change" if this view prevails, he warned.

While this may seem like a complete inversion of what corporations and corporate planning are all about today, Wiliamsen added, "It does serve to show the ethical neutrality of a means to an end, in this case, the neutrality of a computer-based technology that can bewitch us into thinking that all systemization and quantification are intrinsically good."

'Postindustrial Society'

On the other hand, the keynoter reminded the gathering sponsored by Austin, Texas-based Execucom Systems Corp., "Another and more acceptable view of the future of corporate planning can be roughed out in terms of the 'postindustrial society' that sociologist Daniel Bell has predicted will emerge as we move toward the year 2000."

The creation of a new intellectual technology forecast by Bell to handle decision making "is, of course, a concept we have frequently touched on — the one based on the rapidly growing information sciences and computer technology. Our computer planning technology is just one example," according to Williamsen.

"In the special case of corporate planning, Bell's first dimension (in which he sees a change from a goods-producing to a service economy) relates to the question of planning objectives and where they fit in the frame of corporate objectives and directions generally. This area is largely ignored in favor of planning technology," he continued.

"The corporate planning community's sensitivity to Bell's second and third dimensions" — in which he predicted the preeminence of the professional and technical class and the centrality of theoretical knowledge as the source of innovation and of policy formulation for the society — "helps to explain the lack of focus on planning objectives and their formulation and evaluation," Williamsen asserted.

"Quite simply, there is today an accelerating shift toward the professional and technically oriented planner in the corporation. Along with this, we are seeing great emphasis on the 'axial principle,' which focuses on theoretical knowledge," he said.

In contrast to Bell's fourth dimension of the postindustrial society in which he sees control of technology and technological assessment, Williamsen currently sees a "preoccupation in planning the technological underpinnings of the corporation's business area — assessments of its value and contribution to the bottom line."

To bring today's computer-based corporate planning into postindustrial society, developers will have to put a "front-end" on it: "a piece which puts planning technology in perspective by subordinating it to the corporation's objectives generally. More specifically," Williamsen added, "it would be subordinate to planning objectives and to the corporation's philosophy and style of forming and evaluating them.

"The gap between our understanding of the true nature and role of corporate planning and our toolbox-oriented ability to do it will widen until there is a pressing need to know what we are doing in corporate planning and why," he warned in conclusion.

College Sidesteps Funding Crunch By Constructing Its Own DBMS

ATLANTA — If you can't get funds appropriated for purchase of a data base management system (DBMS), perhaps you can build one yourself like DPers at West Georgia College did.

That was the advice given here at Expo '78 by Joseph Doldan, the state college's director of information processing.

Before creating its DBMS, West Georgia was basically a file processor, Doldan indicated, with many separate files on students, staff, faculty and labor. Separate files were maintained for each class of personnel for use in processing payroll, personnel records, class schedules, grades and the like on the college's 256K IBM 360/40, he said.

When the legislature rejected its funds request for a DBMS, the college built one oriented around "people," he said, but it didn't move forward in a vacuum.

Since they knew the state would eventually move into IBM's MIS, the implementation team, some of whom had had experience with the Total system from Cincom Systems, Inc., structured the system to permit relatively easy conversion.

Record structures were built around common data elements such as demographic information and academic records, he said.

Doldan reminded attendees who are considering going to DBMS not to do it without carefully defining the relationship between the system's users and the implementation team. The users will establish the needs, set the limitations and exceptions, evaluate the system after it is implemented and experience the problems, he said.

Carefully established priorities are critical as is support from upper management, he noted.

He also urged attendees to strike a balance between short- and long-range plans in accordance with their organization's goals.

Sometimes it might be necessary to work toward a common data base through a halfway point of multiple data bases in order to keep those old programs running, he said, indicating that was nothing to be embarrassed about.

Finally, he said, information management must be controlled if the DBMS is going to be effective for decision making.

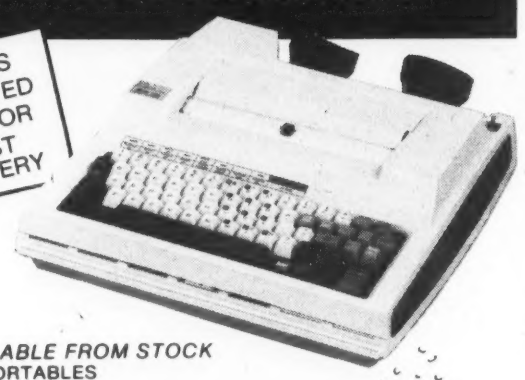
Student Program Planned For DPMA Conference

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) has issued invitations to its 100 student organizations to submit papers for a special students' program at the DPMA's 27th annual conference. Dr. James R. Oliver, vice-president for administrative affairs, said he hopes the writers of the best papers will present them at the conference in New Orleans.

The conference, which will be held at the New Orleans Hilton Hotel Oct. 29 - Nov. 2, will also include presentations on career outlook, growth potentials and planning in the information processing field. This is the first time the special student's program has been conducted, the DPMA said.

CIT COMPUTER INTERFACE TECHNOLOGY
BUY-SELL-TRADE □ WE'RE THE BEST IN THE WEST
FOR DEC, DG, INTERDATA EQUIPMENT
SAVE 10% to 50% ON YOUR MINI NEEDS
THIS MONTH'S SPECIALS
PDP-11 32KB Memory, New $975
Shugart SA800/1 Drive, New $450
CDL-11 A,B,C,D,E, Async Interface, New ..$420
2080 South Grand, Santa Ana, CA 92705
Hot Line (714) 979-9920
BROKER-DISTRIBUTOR-MANUFACTURER

NOVA & ECLIPSE MAINTENANCE
(Who Needs Those Hardware Headaches?)
CSSC has now expanded its maintenance service to include nationwide depot service at fixed rates for all Data General NOVA and ECLIPSE lines. Turn around is normally within 72 hours with service being performed by qualified field engineers. Plug in compatibles also serviced. Still available is our on-call and per-call field service at rates much less than the competition.
NEED FAST TURNAROUND? CALL OR WRITE:
COMPUTER SYSTEMS SUPPORT CORPORATION
9112 Gaither Road
Gaithersburg, Maryland 20760
DEPOT SERVICE (301) 948-6550
FIELD SERVICE (301) 424-7870

TEXAS INSTRUMENTS
MODEL 765/763 PORTABLE ASR'S
WITH BUBBLE MEMORY
ORDERS ACCEPTED NOW FOR FIRST DELIVERY

AVAILABLE FROM STOCK
T. I. PORTABLES
T. I. ASR & KSR
ADDS CRTS
DATA GEN. TELEPRINTERS
DECWRITERS
DIABLO PRINTERS
FLOPPY DISKS
TECHTRAN DIGITAL RECORDERS
Westwood Associates, inc.
DATA COMMUNICATIONS EQUIPMENT
1442 Broad Street, Bloomfield, N.J. 07003
(201) 338-0200 (212) 964-3018 Philadelphia Area (609) 829-7280

Enthusiasm Marks Experiment

Handicapped Receive DP Operator Training

By Howard A. Karten
CW Staff

BASSETT, Calif.— The first effort in the U.S. to train developmentally handicapped people as computer operators is working here at the San Gabriel Valley Training Center. If the experiment succeeds, it could open up new avenues of regular employment for some of America's most severely disabled individuals.

The program, aided by a grant from IBM, was completed by nine of its original 11 students. Most of these have already started internships at local businesses, including Southern California Edison, IBM and the Glendora Community Hospital.

One of the people in the business community who has worked with an intern is Helen Vafakos of Southern California Edison in Los Angeles. She said trainee Cindy Peterson "is working very satisfactorily, is well accepted and communicates well with the others. She is persistent and very enthusiastic, and her enthusiasm has rubbed off on others." Vafakos added that Peterson "is an eager and highly motivated employee."

Program 5 Months Old

The program was started five months ago following conversations between Dr. David French, director of the Work Adjustment Program and clinical services for the training center and an IBM employee who has a daughter at the center. Five students were selected for an introductory course in computer operations.

In the last session of that course, Mary Fuad, an IBM systems engineer who volunteered to develop the program, made a videotape of the students and showed it to IBM in hopes of getting a grant for the project. She got the grant, along with two System 32s, a 3741 data entry station and teaching materials.

The students selected all have mild disabilities, including autism, cerebral palsy and retardation. However, according to Fuad, they compensate for these disabilities with their enthusiasm. "The motivation of these people was incredibly high." One student with cerebral palsy, Fuad said, worked for three hours every night practicing her typing.

Programmed Instruction

To train the students, Fuad began with the IBM programmed instruction course. She expanded both the content of the course and the length of time it took. As a result, she said, "They probably know more than most operators because they know internals and what's making the machine tick, rather than just knowing what to type."

Fuad, who has a B.A. in education, said that two of the biggest problems she faced were attention span and socialization. Her students had a short attention span to begin with, and there were continual disruptions of the class by center personnel showing the program to visitors. Despite this, she said, she had little trouble keeping their attention.

Peer pressure and the student's motivation also contributed heavily to the program's success. "My God, you have never seen such incredible performance from these people . . . it has just been amazing. Dedication is very characteristic of the population; they just want to be able to work," Fuad said.

"The things I worked the hardest on were emotional," she added. A significant part of the computer operator training program at the center is group therapy and concentrates on improving the self-image of the participants.

"I saw five years' worth of intensive therapy improvements in six months," Fuad said, adding that she expects her pupils to be a valuable asset to their employers. "Many jobs in DP are routine and have high turnover, but I expect these people to be with their employers for a long time, because they are so challenged and motivated."

Preinterview Help

Because of the difficulties handicapped people often face in looking for jobs, Fuad did some preinterview work with potential employers. "I would talk about the students' motivation and dedication to potential employers, and they would say 'I think they would be a positive worker model to my people, because they will love their work.' "

Once the employers were briefed about the students, the interviews went more easily for both, since the employers knew what to expect, she said.

Commenting on the program, Peter Davids, manager of the IBM General Systems Division's Equal Opportunities Program, said, "IBM is very interested in identifying community projects involving the handicapped that are beneficial to as many handicapped individuals as possible. Every IBM location in the country has a charge to do things like this for the community."

As far as its experience with the program, Davids added, "We're delighted with what we see so far and with the prospects for the future . . . This has given us the impetus to give consideration to other such projects."

Good performance measurement takes more than luck

QCM/SPM VS. HARDWARE MONITORS
QCM's Systems Performance Module performs most hardware monitor functions, yet gives you the operating system software measurements that only an event-driven monitor can provide.

QCM/SPM VS. SAMPLING SYSTEMS
QCM's Systems Performance Module can monitor what today's sampling systems can not, such as disabled code, control unit activity and shared DASD interference.

QCM
"the others just don't measure up"

QCM/SPI VS. ONLINE PERFORMANCE MONITORS
If you want to look at and resolve your real time problems, QCM's Systems Performance Interrogator contains event-driven measurement functions . . . not just control block chasing.

QCM/JAB VS. SMF/RMF DATA REDUCERS
QCM's Job Analysis and Billing is the only system that supplements SMF and RMF data to provide a truly accurate job accounting and capacity management system.

I would like additional information on the most comprehensive and complete family of products in CPE.

Name_____
Title_____
Company_____
Address_____ Telephone_____
City_____ State_____ ZIP_____
Operating System ☐ MVS ☐ VS ☐ OS

DUQUESNE SYSTEMS INC
1511 Park Building
355 Fifth Avenue
Pittsburgh, Pa. 15222
(412) 281-9055

User Enthusiasm Called Key to DDP Success

By Tim Scannell
CW Staff

ATLANTA — User enthusiasm and education are critical for the successful operation of a distributed data processing (DDP) system, according to Richard P. Jones, marketing vice-president at Dataflo Systems.

"If users are not particularly enthusiastic about a system, it won't work, but if they are, they'll make the 'lousiest' system function and nobody would know the difference," Jones said here at Computer Expo '78.

Education is equally important because it tends to "get things out of the hands of the experts" and into those of people who have actual DP experience, Jones continued.

"DDP means different things to different people," Jones explained. Generally, "users use it to mean what they want it to mean." Technically, DDP is "the functional distribution of certain DP activities along logical organizational lines," Jones said.

DDP has actually been around for quite some time, but in different degrees, Jones explained. A 25% DDP site could be likened to a CPU with several dumb terminal stations that are used "for inquiry . . . or for printing."

A mainframe with intelligent terminals can consequently be a 50% site because there is some processing involved at each station, rather than just "slave" printing, he said.

Independent or remote computers, directed by a standard protocol or under close control, is the next degree, Jones related. Work at each station is supervised from a central point or facility that dictates what work is supposed to be performed.

The final degree, or a 100% DDP center, is one in which everybody at each station "is allowed to do their own thing however they want to do it," Jones said. The central mainframe is eliminated altogether and each manager functions within certain limitations.

Jones sees DDP as the natural evolution of things in DP. Initially, there was one single computer that was designed to perform a single function such as complex calculations or census tallies.

This machine evolved into a computer that was capable of performing several tasks concurrently in a time-sharing or shared-processing mode, Jones stated.

The final step in the DP evolution process is the use of multiple computers, each of which performs a dedicated task.

"This, in a sense, is back where we started from, but on a higher plateau of technology," Jones observed.

Conversion Advantages

There are many obvious advantages to converting to a DDP system, Jones continued. First of all, the equipment is considerably less expensive than full-scale mainframes. "At Dataflow, for instance, we have six Digital Equipment Corp. PDP-11s and every one of them is 20% faster than the IBM 1401 that, as recently as 1966, was the corporate computer," Jones said. "All six minicomputers together didn't cost half as much as the 1401 did," he added.

Because of the elimination of complex software routines, fewer experts are needed, Jones stated. "Conversely, fewer specialists can get a lot more done a lot faster."

Upgrading a system isn't as difficult as with a larger mainframe. "It's a modular kind of thing rather than the huge jump that users have to take when they run out of gas with the big machines," he remarked.

One of the great advantages of DDP is that it gives each user a renewed sense of responsibility. "The user becomes immediately involved and responsible for what is accomplished. This eliminates the 'them' and 'us' syndrome," Jones pointed out. The user accepts change because he wants it, he said.

Other advantages include a more realistic approach to DP needs and functions from the user's point of view. Suddenly, the user is in charge of his own station and sees the problems and restrictions firsthand, Jones noted. Each organization has its individual jobs to perform which disperses the workload, relieving the bottleneck problem, Jones added.

Finally, each workstation is, in itself, a backup computer site. "When something is down, the whole world doesn't stop — only that piece," he noted.

Some Disadvantages

On the other hand, Jones described some disadvantages to a distributed system.

Security becomes a much greater problem since the intelligent terminals are scattered all over the building or the country. "It is less secure than if you have them locked into a room," Jones said.

Servicing the equipment becomes a problem because it is not located at one central site. "It isn't like someone driving up the road" to service your machines, he noted.

There also seems to be a problem of control or getting the users at the various stations to follow operational rules, he said.

Opposition from the central DP department personnel is also an occasional problem, Jones said. "They see it as a loss of control of their empire, so to speak, when it should be seen as an opportunity to enhance their value to the company," he stated.

Architecture of Data Bases To Change in '80s: Diebold

VENICE, Italy — In the 1980s, changes in the need for information will require a new architecture of data bases designed so intelligence can be synthesized from a pool of data and retrieved in ways not yet developed by most organizations, according to John Diebold, chairman of the Diebold Group, Inc.

In delivering the keynote address to the 40th plenary meeting of The Diebold Research Program/Europe here recently, Diebold said, "I feel information will be recognized as a valuable resource on the same level as capital and labor. We shall abandon the time when it has been consistently underpriced, underutilized and its contribution underrated."

As support for his theory, Diebold cited the fact that organizations are experiencing new needs. Supply uncertainties and changes are placing emphasis on "supply management" rather than the "demand management" where most place emphasis today, Diebold said. Adjustments will have to be made to allow organizations to review their product mix on an ever more frequent basis.

International uncertainties, profit squeeze and the proliferation of areas in which the corporation is evaluated will force those corporations that want to remain competitive to rethink their information needs, he asserted.

To allow more cost-effective resources, information will be used for planning and decision-making as well as to measure performance and the organization's responsiveness to its growing constituencies, he said.

Diebold stated that information architectures will have to be redesigned to respond to these emerging needs because, first of all, the wrong information is generated. Second, he said raw data is often contained in data bases that cannot communicate among themselves and thirdly, even assuming corporations could generate the correct information, it would take too long to do it because large applications can't be produced in a period of less than several months to a year.

Some of the limitations of our present information architectures are not compatible with the needs of faster business response to unplanned change or the greater complexity of performance measurement that organizations will need in the 1980s, Diebold said.

Architecture Models

Models of interactive computing with a cohesive data base architecture are not new, Diebold said. They have been used in specialized areas such as rent-a-car businesses and airline reservations. The differences between these and those that will be needed in the future are differences of scale. Corporations will need a major diffusion of these principles so they will be applicable to all operations in the 1980s, he asserted.

The new systems will enable corporations to generate new forms of information, change plans and implement them in a short response time and introduce complex performance measurements.

Development of this information architecture will take years of first building an information infrastructure, then application systems and finally communications networks, he said.

The new information philosophy will be accompanied by emphasis on data structures, on super mainframes with massive bubble memory or on yet larger minicomputers with high-capacity communications links.

TERMINALS FROM TRANSNET

VT52 DECscope

24 LINES OF 80 CHARACTERS • 75 TO 9600 BAUD
EXTENSIVE CURSOR CONTROLS • HOLD-SCREEN MODE
SWITCHABLE AUDIO CLICK • OPTIONAL PRINTER INTERFACE

4 - PACK
$1,495 each
IN QUANTITIES OF FOUR
EITHER 20 mA OR EIA RS232C
IMMEDIATE SHIPMENT
Offer limited to orders received by July 31, 1978
for shipment through September 30, 1978

FULL OWNERSHIP PLAN, PER DECSCOPE
12 Months $140 month 24 Months $76 month

PURCHASE, FULL OWNERSHIP, RENTAL AND LEASE PLANS
AVAILABLE ON POPULAR EQUIPMENT

DEC	QUME	TI	ADDS	ADM	DATA PROD.
DECwriter II DECwriter III DECprinter DECscope VT52, VT50 DECgraphic VT55	Letter Quality Printer Sprint 5 RO & KSR	Silent 700 Series 743-745-765 Printer 810 RO	CRT Regent 100 Regent 200	CRT ADM 1 ADM 2 ADM 3A	Line Printers 300 LPM 600 LPM 900 LPM 1200 LPM 1500 LPM

ACCESSORIES AND PERIPHERAL EQUIPMENT
ACOUSTIC COUPLERS • MODEMS • RIBBONS • THERMAL PAPER
INTERFACE MODULES • DISKETTE UNITS

TRANSNET CORPORATION
2005 ROUTE 22 • UNION, N.J. 07083
201-688-7800

Via DP Matching Project

Sheriffs' Offices to Pool Inmate Escort Teams

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Sixteen sheriffs' offices across the country will start pooling the escort teams they use to transfer prisoners from state to state this month with the aid of a computer-aided project expected to save the sheriffs' departments about $200 per trip, the Justice Department announced here recently.

Project Captis, financed by a $432,960 Law Enforcement Assistance Administration (LEAA) grant as a six-month pilot program, is designed to cut costs by making it possible for escort teams to carry prisoners in both directions instead of only one way on many of their interstate trips, the department said.

Sheriffs will enter their future prisoner transfer plans into the system, including such nonsensitive information as the Originating Agency Identifier (a nine-character identifier assigned to every law enforcement agency, court and corrections institution in the country); sex of the prisoner; a subject danger code, (indicating the relative risk in transporting a prisoner, and the earliest and latest transfer dates possible, according to David Hudak, the Captis project director for the National Sheriffs' Association.

The Captis data base is stored in a Prime Computer, Inc. Model 300 with 128K words of memory located at the Association's national headquarters here, according to Hudak.

National Vehicle

Captis will use the National Law Enforcement Telecommunications System (Nlets), in existence since 1964, as the vehicle for its message switching, according to Norbert Schroeder, a communications specialist for the National Criminal Justice Information and Statistics Service who is working with the sheriffs' association.

Nlets, which was upgraded in 1973, is a message-switching communications network used by federal and state law enforcement and criminal justice agencies throughout the U.S., except Hawaii, to swap criminal information. The system is accessed by 6,000 terminals, according to Executive Director Timothy Sweeney.

Nlets is based on a Data General Corp. Nova 800 minicomputer with 48K words of memory located in Phoenix. The controller was custom designed for Nlets by Action Communications Systems, Inc., Sweeney said.

"What will happen, I'm sure, is that the really risky prisoners won't be put into the system; they'll be handled with relative security. This is designed for the more mundane prisoners, so we can make use of team work in transferring prisoners," Hudak said.

$200 Savings

About 50,000 prisoners were transported across state lines in 1976 at a cost of $25 million, or an average of $500 per trip, according to the LEAA. Using Captis, the cost of each trip that is matched up with another will be about $300, the LEAA estimates. More current (1977) figures are not available.

The participating counties are Pinellas and Hillsborough, Fla.; Jefferson, Colo.; Maricopa, Ariz.; Salt Lake, Utah; Multnomah, Ore.; Los Angeles, Calif.; Milwaukee, Wis.; Montgomery, Md.; Cobb, Ga.; Tarrant, Texas; Natrona, Wyo.; Cumberland, N.C.; Ada, Idaho; Ingram, Mich.; and Shawnee, Kan.

Even though the system will start with only 16 sheriffs' offices as members, anyone with access to Nlets will have access to the Captis information, according to Hudak. There is no charge to the user.

Afips Appoints D.C. Office Head

WASHINGTON, D.C. — Alexander D. Roth has been named director of the American Federation of Information Processing Societies (Afips) Washington office. Roth, a lawyer, replaces Philip S. Nyborg, who will become vice-president and general counsel for the Computer and Communications Industry Association (CCIA).

In addition to his experience in several areas of law, Roth worked for IBM for four years as a programmer, systems engineer and technical representative.

Roth comes to the post from Swift & Co. in Chicago, where he was a member of the law department. Prior to that, he served part-time as director of the Law School Computer Facility at the University of Michigan, where he was involved in consulting and administrative support, including providing computer services for law school classes and faculty research projects.

Afips is a federation of 15 nonprofit scientific, educational and professional societies representing approximately 120,000 individuals concerned with computers and their applications. The Washington office was established in 1975 to provide an information service to Afips constituent societies and to make available to government groups some of Afips' technology-related expertise.

The 370/138 and 370/148. Two great computers.

We lease them for less. NOW.

If you've decided to install a 370/138 or 370/148, call Greyhound. If you've already placed an order for a 370/138 or 370/148, call Greyhound. If you have one of these computers installed, be sure and call Greyhound.

If you have a need for the computer now but you have been given a late delivery date, call Greyhound. We'll deliver one of our 138's or 148's when needed and still lease it at substantial savings.

If you order between now and June 15, you can take advantage of our special 1 to 5-year True Operating Leases* that can save you a substantial amount of money every month. And no matter whether you've just decided on a 370, or have taken delivery of one, we'll work out a lease plan that will pay off handsomely on the bottom line at the end of the year.

If you've chosen a 370/138 or 370/148, you've selected one of the best computers in the world. At Greyhound, we create the best lease plans in the world. So you can have their great computer... at our low price. Call today.

CALL: 800-528-6113

GREYHOUND COMPUTER CORPORATION
Greyhound Tower, Phoenix, Arizona 85077

**True Operating Leases – Walk-away at end of term... Without penalties or residual guarantees*

Morin to Keynote DPMA Conference

BLOOMINGTON, Minn. — David Morin, director of International Data Corp.'s Information Systems Services, will keynote the Region IV Conference of the Data Processing Management Association (DPMA) here May 10 at the Radisson South Hotel.

His talk, "Planning for Change," will focus on trends in personnel costs, distributed processing and other areas that affect the DP effort.

For more information, contact the Northwest Chapter of the DPMA, Box 9566, Minneapolis, Minn. 55440.

May IDC Seminars to Examine Small Systems, '80s Environments

WALTHAM, Mass. — International Data Corp. (IDC) will present two seminars in May, "Small Computers at Large User Operations" and "EDP Organizations Environment in the 1980's." The first program, to be held May 22-23, will include research results, consultant presentations and vendor, user and consultant viewpoints on the supermini alternative, a spokesman said.

The second program, to be offered May 24, will discuss user budgeting, DP personnel problems and solutions, hardware, software environments and IBM strategy.

The programs will take place at the Rye Hilton in Port Chester, N.Y. Price for "Small Computers at Large User Organizations" is $495 for a single attendee and $350 for each additional team member. "EDP Operations Environment in the 1980s" will cost $245 for a single and $175 for additional members. Cost to attend both seminars is $695 for a single attendee and $495 for each additional team member.

The programs will be repeated in June at the O'Hare Inn in Chicago. "Small Computers/Large Users" will be offered on June 26-27, and "EDP Operations" will be held June 28.

For further information, contact Jayne Bell, IDC, Box 915, Waltham, Mass. 02154.

NSF Leases Data Base Of Science Citations

PHILADELPHIA — A just-developed *Science Citation Index* (SCI) data base said to provide bibliographic information in the areas of program planning, science policy and the sociology and history of science and scientific communication has been leased by the National Science Foundation (NSF).

The agreement gives NSF, its grantees and contractors access to the complete data base, which was developed by the Institute for Scientific Information (ISI), here.

The references cited by a given source publication are accumulated by the SCI, an ISI spokesman said, noting that more than five million source items have been indexed to date, and more than 50 million references to earlier works have been extracted from these items.

The NSF is said to be using all of the SCI's three major sections: a source index alphabetically listing authors who have recently published in journals covered by SCI; corporate index containing each of the authors' institutional affiliations; and a citation index alphabetically listing references cited at the end of each source item.

The NSF has been applying the SCI to examination of the structure of scientific specialties. Data from the index has also been used in studies of scientific review literature and in NSF evaluations of its own internal programs and functions, such as peer review, the spokesman added.

Requests for more information on the SCI should be directed to Dr. Morton V. Malin, ISI vice-president for professional relations and contract research, 325 Chestnut St., Philadelphia, Pa. 19106.

Contract Negotiations Topic of June Course

NEW YORK — A three-day course in "Computer Contract Negotiation" will be held June 5-7 at the St. Moritz Hotel here.

The course will reportedly address the legal and financial aspects of contracting for DP products and services. It is designed for managers, attorneys, financial officers and other professionals responsible for protecting an organization's interests, a spokesman said.

Among the 20 segments of the course are "Introduction to the Contracting Process," "History and Possibility of Good Contracting Practices," "The Steps to a Signed Contract," "Understanding Your Adversary" and "Software Development Contracts."

The course will be taught by Joseph Auer, president of International Computer Negotiations, Inc. (ICN); Dick H. Brandon, president of Brandon Consulting Group, Inc.; and Sidney Segelstein, a partner with the law firm of Goldstein & Schrank.

The course is sponsored by Brandon Consulting Group, ICN and Brandon Systems Institute.

Preregistration is required, the spokesman said. The $575 fee includes the course text, a copy of the book *Data Processing Contracts — Structure, Contents & Negotiation,"* bound copies of ICN's monthly *Computer Negotiation Reports,* various reference materials and luncheon.

Additional information can be obtained from Ruth Dargis, Brandon Consulting Group, Inc., 505 Park Ave., New York, N.Y. 10022.

SOFTWARE YOU SHOULD KNOW ABOUT

DASD CORPORATION: I'm interested in:

TRANSLATING
☐ *RPG to COBOL (DOS or OS)*
☐ *SYSTEM/3 COBOL to OS COBOL*
☐ *DOS COBOL to OS COBOL*
☐ *GE MAP to OS COBOL*
☐ *360/20 BAL to 360/370 OS ALC*

TSO
☐ Increasing my capabilities with TSO with Video Programming Tools. VIP simplifies the creation and modification of data files and will automatically flowchart JCL procedures.

CICS
☐ Saving 75% of my programming BMS coding time and automatically printing hard copy screen images with MAPGEN.

DASD CORPORATION
National Marketing
1480 Renaissance Drive,
Suite 315
Park Ridge, Illinois 60068
312/299-5005

DASD CORPORATION

PLEASE SEND DETAILED INFORMATION TO:

NAME .....

COMPANY ..... **TITLE** .....

ADDRESS ..... **PHONE** .....

AD-VICE

Neither a borrower nor a lender be
For log oft loses both itself and friend;
And borrowing dulls the edge of husbandry.

Refrain from log polygamisting,
Sharing one communal listing
With all partitions coexisting—
Start CONSOLOG monogamisting:

It prints your log when your job's ended—
All the time, or when abended.
No waiting 'round till DOCs is dumped;
Or interruptions when you're stumped.
Every person has his own—
Yours is yours, and yours alone!

This above all, to thine ownself be true;
Your CONSOLOG message belongs to you!

CONSOLOG

Automatically logs partition console messages to the printer at end-of-job.

Eliminates printlog utility runs that interrupt normal processing.

Lets you select message logging for all jobs or only for abends and tests.

Uses no core, installs in minutes on any IBM 370 DOS/VS with DOCs (125D) or 3277.

Free 30 Day Trial

☐ Send More Info ☐ Send CONSOLOG for 30 Days
Name _____ Co. _____
Title _____ Tel. _____
Address _____
City _____ State _____ Zip _____
Computer Model _____ ☐ 125D or ☐ 3277

DATACHRON CORP. 174 FIFTH AVE. NEW YORK, N.Y. 10010 (212) 675-5333

Library Saves $370,000 on System Conversion

By Marguerite Zientara
CW Staff

TACOMA, Wash.— The Tacoma Public Library (TPL) here recently automated its book circulation system to save time and provide better service, and thanks to a staff-developed model conversion system, the library reportedly saved an estimated $370,000 on the project.

The Automated Library Information System (Alis), developed by Dataphase Systems, Inc. of Kansas City, Mo., is essentially a "massive inventory control" system, according to a library spokesman. The system can check library materials in or out instantaneously through the use of Recognition Equipment, Inc. Model 40 optical character recognition (OCR) wands connected to 14 Beehive Medical Electronics, Inc. B100 CRT terminals, according to Kevin Hegarty, library director.

The system also offers many other features, according to Hegarty, but to get these benefits the library had to convert its manual card file for use by the computer, and that's where the staff's money-saving thinking entered.

Data Base Purchased

Historically, libraries have sent their manual card files to service bureaus for conversion, often at a cost of $1.50 to $1.60 per title. "With the number of titles we have — a quarter of a million — we're talking about a considerable cost," Hegarty said.

TPL instead purchased a data base of 1.9 million titles "typical to a public library" from Blackwell North America, Inc., a Portland, Ore. vendor of books and computer services. These data base tapes include the author, title, Library of Congress (LC) number and other information about each book in machine-readable form, Hegarty said.

The Blackwell North America data base was stripped to a basic abbreviated record (from 1,000 bit/record to an average of 400 bit/record), excluding added entries, so the entire data base could be contained in the minicomputer using two Control Data Corp. 300M-byte disk drives, according to Hegarty. The system also includes a Data General Corp. 6021 magnetic tape drive.

The library's 250,000 titles are matched to this data base using search keys such as LC number, International Standard Book Number (ISBN), author, author/title or title, Hegarty explained. The LC number, when available, is sufficient for a "hit" 90% of the time, he said.

As hits occur, the holdings are marked for inclusion in the TPL data base, with local item information added. "Misses" are keyed into a currently created data base using standard cataloging techniques.

Approximately 80% of the library's collection is listed on the tapes, Hegarty said. The rest must be converted piece by piece directly from the books, a process which takes "10 times as long," he said.

When the conversion is complete, the 1.9-million-title data base will contain TPL holdings only. At that time, the TPL data base will be sent to the Washington Library Network (WLN), a statewide group of libraries that is developing an automated information system, for inclusion in its data base, Hegarty explained.

Blackwell North America update tapes are added weekly, ensuring the currency of the data base. "We intend to keep the data base in our minicomputer for three years under our contract with Blackwell. During that time, other WLN libraries in the state can access the data base while it resides here," Hegarty said.

System Costs

Cost of the entire TPL system will be $280,883, Hegarty said, which includes a one-time software charge of $50,000. The one-time installation charge was $12,000. "Another library coming into the circulation system will not incur either charge," Hegarty said. The total cost figure also includes a 5.1% sales tax.

The library began on-line operations April 3 for a 60-day trial period at the main branch and will operate in the library's other branches beginning in September.

Tacoma Public Library is the second library in the nation to use the OCR wand for its circulation system, Hegarty said.

The wand reads the identification number of the book label as well as the number assigned to each library patron's coded library card and inputs that information to the system's DG Nova 3 minicomputer, Hegarty said.

When the book is returned, its identification number is disassociated from the patron's number and erased from the memory bank, so there will be no record of what an individual patron is reading.

In addition to checking books out, the system can indicate when a book is returned and whether there is a reserve hold on it. Before the computerization, librarians had to review long lists of reserve books, which was "quite a pain," a spokesman said.

Overdue notices were previously processed "with great labor," but now the system will automatically print an overdue notice on three-part forms, which then merely have to be franked and mailed, Hegarty said.

In September, when all branches go on-line, the system will be able to indicate instantaneously which branches have copies of a particular book.

The Alis system will serve as a prototype for participants of the WLN, Hegarty said.

Future plans for the system include printing catalog cards and spine labels; checking in periodicals, of which the library receives hundreds; printing missing periodical notices for vendors; and keeping track of books on order. Within two years, the library anticipates the system will furnish it with a microfilm catalog of all the library's holdings, information contained on about five million cards.

Why EFM can offer you a lease proposal in 48 hours on this year's 3033, 3032 or 3031.

"Gentlemen, our leasing program is ready for the new 303X series of computers. The financing is in place. Our lease documentation is standard and easy to read. And, we have 10 years of experience behind us."
Truman Rice, President
EFM Computer Leasing

"True. But we should tell our customers and prospects all about the new EFM 303X leasing program."

"Right! Our present customers already know about our proven track record and unique computer leasing services."
Neil Glaubman, Executive Vice President
EFM Computer Leasing

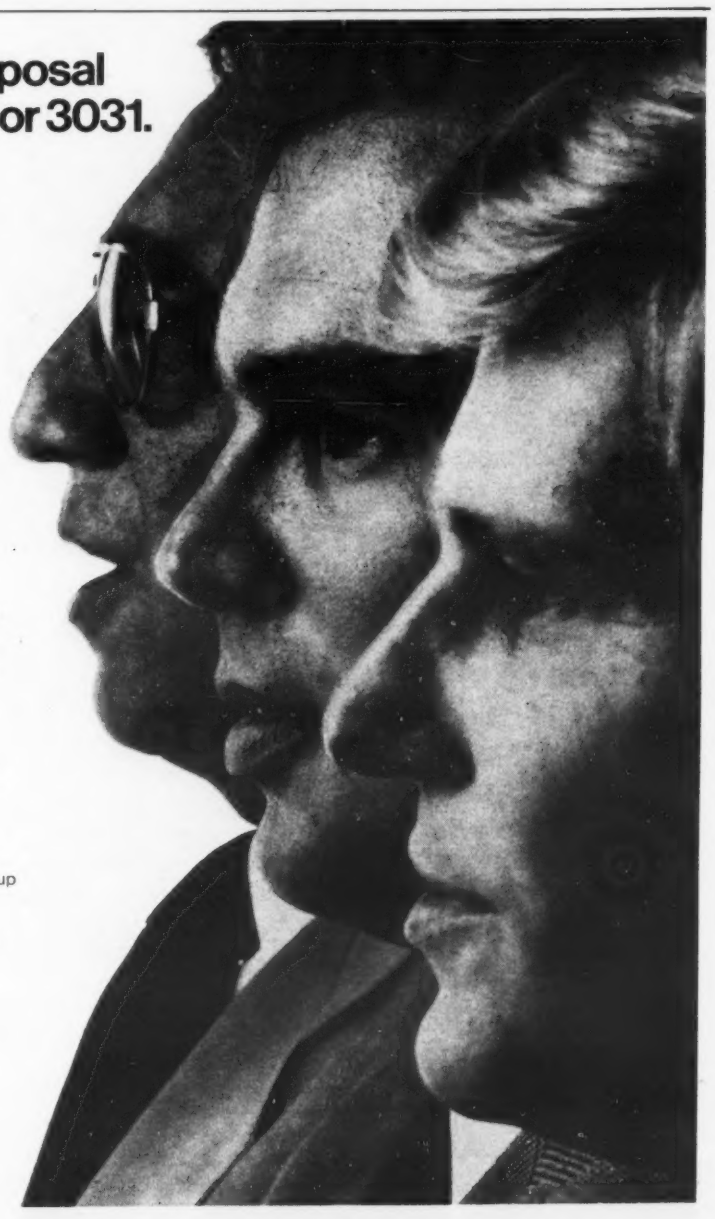
"What about our lease rates and upgrade provisions?"
Steve Zaleskie, Marketing Manager
EFM Computer Leasing

"Rick, will you answer that?"

"Steve, our leases can provide for upgrading. And our rates are the best in the industry."
Rick Kohn, Executive Vice President and Chief Financial Officer, EFM Group

"303X deliveries have started. So let's go!"

"We're ready to deliver, too."
Neil, Steve and Rick – in unison



Just call (516) 488-7876 (collect).

EFM Computer Leasing, Inc.
A Subsidiary of the EFM Group
3000 Marcus Avenue, Lake Success, New York 11040

EFM Computer Leasing is a member of the Computer Lessors Association.

Users Urged Not to Reject Third-Party Leases

By Tim Scannell
CW Staff

ATLANTA — Third-party leasing is something a lot of users don't get involved in because they're afraid, Ken Brindle, vice-president of International Computer Negotiations, Inc. said here recently at Computer Expo '78.

A well-negotiated third-party lease is generally less expensive from the user's point of view. Most lessors offer a structured payment plan that is "pretty much limited to the creativity of the person putting the arrangement together for you," Brindle remarked.

Third-party leasing is basically an operating lease whereby a user pays for use of the equipment rather than for the hardware itself, he explained. "The manufacturer is happy because he gets his money Day One, the user's happy because he's actually paying less and the leasing company is obviously happy or it wouldn't be in the business," he said.

One third-party leasing plan is called a step lease; it allows users to contract for computer equipment at staggered prices. For instance, equipment that might normally cost the user $15,000/mo can be acquired for payments that amount to $9,000/mo in the first 12 months, $12,000/mo in the next 24 months and jump to $18,000/mo in the final 36 months.

This way, a user's payments increase as his profits increase — making less of a strain on the company's books, Brindle noted. The plan can also be used in reverse — higher payments to lower — for companies with a firm financial foundation.

Knowing a lessor's residual rates, or the amount of return on equipment, is an important factor of third-party leasing, Brindle said. "What you need to know when you negotiate a third-party lease is the same thing you need to know when you go to buy a car," he observed.

This includes the purchase price of the equipment, the annual interest rate involved, whether there is a residual rate and, if so, how much.

The important thing is that users examine the entire package and see just what they are paying for, Brindle stressed. Residual rates vary from lessor to lessor because each has bought the equipment at a different price.

It's not unusual to find a user paying for $1 million worth of equipment that, in fact, cost the lessor $750,000, Brindle pointed out.

The Negative Side

There are, of course, some negative aspects in third-party leasing, Brindle stated. For one thing, the contract usually involves making a commitment of five years or more.

Before anything is signed, a user should examine the future of his organization and its anticipated growth because entering into a lease too soon can sometimes prove to be a heavy financial burden, Brindle said.

Upgrades, as a part of third-party leasing, are usually "less difficult and more expensive," Brindle explained. A user who wants, for example, a later model disk drive as a replacement for the device he originally leased must first "pay the balance on the equipment already installed, then start paying on the new equipment."

Difference in Dates

In entering into contracts with users, lessors often distinguish between "precommencement rental days" and the actual "installation date" of the equipment, Brindle continued.

A user's lease, according to some contractual provisions, begins on the first of the month if the equipment is installed on that particular date or on the following initial monthly day. If the equipment is not installed on the first, a lessor may charge the user for the days before the following month.

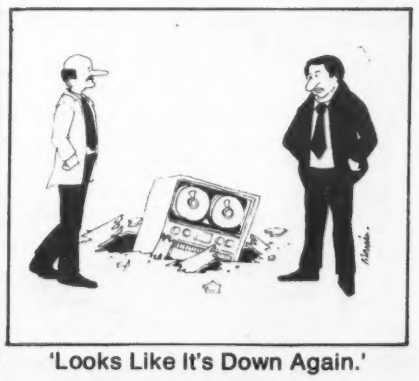
For instance, if a computer is installed on the 10th and the lease doesn't begin until the first of the next month, the user will owe two-thirds of a month's payment in excess of the entire lease price.

The fact is that the user is not responsible for this "excess" fee and "in a lot of cases, it is just 'skim' money — right off the top and into the lessor's pocket," Brindle stated.

Other factors he urged users to keep in mind when entering into a third-party agreement were:

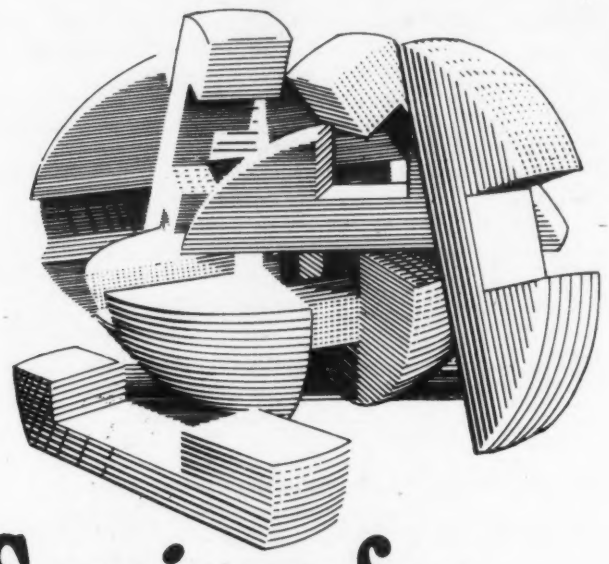
- If the equipment is used, be sure and get the serial number. Check it upon delivery to be sure it is the same piece of equipment.
- Check the contract for "reserve" clauses that might give the vendor the option to provide equipment substitutes.
- Be sure "you are getting the deal you want and not the deal the lessor thinks you might like."

Everything in a lease is usually preapproved by the company, but a salesman, quite naturally, will not "spread out the whole package before you and ask you to pick your choice," Brindle noted.



'Looks Like It's Down Again.'

Puzzled by Database?



Free DBMS Seminar for Problem Solvers. Don't miss it!

If you're a manager, senior DP person or user who needs to put the database puzzle together, you shouldn't miss our free one-day seminar.

It's all about INQUIRE®, the Problem-Solver's DBMS from Infodata Systems.

We'll show you how easily INQUIRE can put all the pieces—data management; on-line processing; built-in flexible reporting; a true user's language; even full text retrieval—together into one unpuzzling package!*

*INQUIRE operates in IBM 360/370 (OS, VS, CMS) plus Amdahl and Itel environments.

INQUIRE DBMS SEMINAR SCHEDULE

New York City	May 3, 1978
Los Angeles	May 16, 1978
Chicago	June 15, 1978
Kansas City	June 21, 1978

Reserve now—space is limited. Fill out the coupon and mail immediately, or call us at (703) 578-3430.

Infodata
Infodata Systems Inc.
5205 Leesburg Pike
Falls Church, Virginia 22041

Please register me for the free INQUIRE seminar in:
☐ New York City ☐ Los Angeles
☐ Kansas City ☐ Chicago

Name
Title
Company
Street Address
City
State Zip
Telephone

Sorry, I can't attend any of the seminars planned, but I'd be interested in:
☐ Boston ☐ Dallas
☐ Philadelphia ☐ St. Louis
☐ Washington, D.C.

© COPYRIGHT 1978 * INQUIRE REGISTERED U.S. PATENT OFFICE TO INFODATA SYSTEMS INC., ROCHESTER, NEW YORK, U.S.A. COVERED BY U.S. PATENT NUMBER 3670310

Machines Not Only Concern

Managers Held Responsible for Their 'Teams'

By Tim Scannell
CW Staff

ATLANTA — Most DP centers are managed like a football team whose coach isn't familiar with all the members and the players themselves aren't even sure who the other players are, according to Jack Stone, managing director of Computer Education International and a *Computerworld* columnist.

Speaking at Computer Expo '78 here recently, Stone said the primary duty of a manager within a DP environment is to act as the referee or intermediary, between the people inside and outside the computer room. Unfortunately, most managers have become so involved with the technology and sophistication of the computer industry that they have forgotten how to deal with people on a personal and humanistic level, he added.

People-Oriented Manager

Stone cited as an example a company that went through six DP directors with no noticeable improvement in the production level of the shop. The company finally hired a manager whose only qualification, aside from his experience, was that he was "a leader of people," Stone recalled.

This "unique" manager referred all of the technical problems to his technical staff while he focused his attention on people. He organized nontechnical meetings during which employees could talk about "human" problems, assignments, career paths or anything else on their minds.

The result was that morale was boosted, interest and pride were renewed and production increased, Stone observed.

Before a manager can start managing, he must stop the in-fighting among his employees, Stone noted. As an example of this "firefighting," Stone highlighted the relationship between operators and the programming staff.

Operators love DP until "they find out they are being accused of failures of the system to output on time," Stone explained. "That's when they get disillusioned."

Corporations don't recognize operators as professionals or supply necessary training, "yet they will hire some 17-year-old kid, sit him in front of a 168 and let him alone on third shift, where he is virtually running the organization," Stone said.

Operators, contrary to what management might think, view themselves as professionals and feel they, too, are entitled to all the physical "trapping" given to systems programmers. These benefits include a desk, a sign embossed with their name, piped-in music, current editions of the operational manuals and, most importantly, the opportunity for career development, Stone said.

Another problem that arises between operations and programming is the "culture conflict," or clash of the higher echelon with the lower. "Systems programmers like to view the machine as *theirs* because they have the responsibility to keep the hardware/-software going. On the other hand, operators view the computer as *theirs* because, after all, they operate the machinery," Stone stated.

When the system fails, however, both parties try to shift the responsibility and disown the system, each blaming the other for the problems.

There are several things managers can do to stop or at least diminish the in-house fighting, Stone said. First, the manager must not take on any new work until the present operations are in order.

"If you can't do well what you are doing now, any additional work will make what you're doing that much poorer," Stone noted. "Until you can stop the workflow, get control of what you're doing at the moment and set up procedures for accomplishing new things, managers will never stop the fighting."

Second, a manager must convince personnel that even though they are part of the team effort, "they also have the ability to express themselves as individuals." Employees should be given the resources and the time to accomplish assigned jobs, Stone said.

Third, everything that happens within the DP center should be done according to a master schedule that is readily available to everyone.

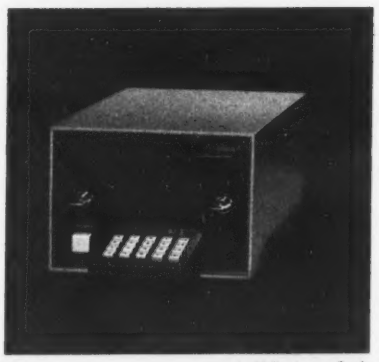
Proper project controls and rules should also be established within the DP environment, but for reasons other than control of the personnel, Stone stated. "Controls are established to ensure that people have the opportunity to turn out high-quality work and to make sure that management doesn't screw up the work schedule."

New Info-guard™ Encryptors

WORRY

About data security even in network transmissions.

New 4100 series Info-guard security modules now add network protection to Motorola's line of data security products. They incorporate the NBS data encryption standard algorithm and are compatible with virtually any communication protocol or data format. Either dedicated or switched line computer systems. They are equally effective in protecting your data from unauthorized or accidental access when installed at host computer or remote terminal sites.



Totally Secret Key Management
A unique key management system selects keys from up to 72 quadrillion possibilities...randomly. Repetitive patterns are eliminated.

Find out how little effort is required for key distribution...even at remote sites. Change keys as frequently as security requirements dictate...and do it so smoothly that even the user doesn't need to know it. See this new addition to our family of Info-guard encryptor modules demonstrated at our National Computer Conference booth #3406-08 in Anaheim, June 5-8.
For more information, call James Booth 602/949-4735 or write him at Motorola's Government Electronics Division, Dept. L-2, P.O. Box 2606, Scottsdale, AZ 85252.

MOTOROLA
OUR FIFTIETH YEAR

AKD (402) 392-2606
VOLUME DATA ENTRY SERVICES . . .
TAPE OR CARDS
"QUALITY AT A LOWER COST"
AMERICAN KEY DATA
Mid America Plaza, Suite 144
7171 Mercy Rd., Omaha, Ne. 68106

MIS Managers' Planning Needs Seen Growing

By Nancy French
CW Staff

ATLANTA — The director of management information services (MIS) whose company will be truly prepared for its future information needs won't be worrying about whether to install System A or System B — he will be planning and tying together the entire information resources of his firm.

That was the view expressed in the keynote session at Expo '78 here last week by Robert Swid, a consultant with Booz, Allen and Hamilton's Washington, D.C. office.

Effective information resource management (IRM) requires formal strategic planning, he said.

In the next five years, managers who only a few years ago were concerned solely with computer system selection will see digital telephones and the ultimate melding of voice and data into input and output digital streams, he said.

The recent introduction of new smart facsimile and optical character recognition terminals will trigger the electronic mail room, he said. Further, teleconferencing — with video, audio and computers — will allow a whole new set of information for simulated face-to-face communications, eventually even between offices and residences.

Smart micrographics, the blending of microfilm and other image techniques with computer technology, the laser printer and portable communicators will be a part of that picture, he predicted. Even so, most of an MIS manager's efforts will focus on the development of what Swid called "interactive workstations."

These workstations will come in three categories: one version for managers and their assistants; a second, specialized version for clerks, typists and others who work "in more of production mode"; and a third for professionals such as programmers, actuaries and designers who need interactive computers and information retrieval support.

The workstations will be used for information transfer, such as correspondence status reporting and commentary; interactive exchange, such as conferencing, inquiry, problem-solving and education, and convenience applications such as message handling, time scheduling and activity recording, Swid said.

Such workstations will require "fairly complicated sets of networks," he said, describing one such network as interorganizational, allowing companies to exchange information with one another electronically.

Four-Phase Plan

To distribute these resources effectively, the MIS manager will need a complete understanding of his organization's business objectives and must integrate them into a four-phase strategic plan, Swid explained.

Phase I involves setting strategic objectives. Some might include growing selectively in certain markets, reducing operating expense ratios and improving customer service.

The IRM function then translates these business needs into a series of strategic objectives that will apply over the next five years. These might include such goals as improving the level of management information systems, reducing operations expenses, raising productivity and enhancing the flexibility of the systems already in place.

Phase II involves using the system strategic objectives that have been developed to "creatively explore the various options that exist." This is done based on a knowledge of the technologies that may emerge in the next five to 10 years together with an objective assessment of the strengths and weaknesses of the existing DP organization, he explained. From here, the MIS manager will be able to derive a set of strategic issues to be addressed.

"What mix of systems activities will be the most rewarding in the next several years? Should the organization tilt toward building brand new standalone systems or, on the other hand, toward developing a single integrated system based on expanding existing systems?"

There are also some "what-if" questions to fold into the mix including "What if the business does not grow as fast as management expects? How would the plan be affected by inflation or depression?"

Phase III involves rating each particular opportunity in terms of its cost/-benefits relationship and its fit with available resources, he said.

The manager who encounters a project with a very high cost/benefit payback that may be inappropriate to implement at a given point in time because of a weakness in the organization or lack of appropriate resources might wish to defer that project for several years and build the strength in the organization that is needed to tackle that particular opportunity, he said.

Only then does Phase IV — system selection — come into play.

Com-plete. The first TP System with sales of over $1,000,000 in its first year.

Why is Com-plete an overnight success? It's CICS, IMS/DC, TSO, and more...all in one easy-to-use package.

No one else puts it all together:
- Terminal-independent mapping.
- Message switching.
- Remote job entry and retrieval.
- Interactive program development.
- Hardware storage protection.
- Data base management.
- File management.
- Multi-threading.
- Interactive utilities.
- Performance tuning.
- Interactive program debugging.
- Full user accounting through SMF.
- Security and recovery management... and more.

There's only one way to get all this in a TP System without overloading your computer and your people. It's Com-plete, the complete communications system from Software ag... and recent winner of International Computer Programs' "Million-in-One" Award.

Here's what Com-plete users say:

"Compared to all other TP Systems, Com-plete uses less core, gives faster response times, improves thru-put, and is easier to use. We replaced our on-line program development system with Com-plete and got improved interactive programming plus on-line transaction processing and more for much less overhead. Furthermore, support from Software ag is the best in the industry."
Gordon Cochrane
Manager, Information Services
R.T. French Company

"We signed a contract to design and deliver a theater and stadium seat reservation system in three months. The system will start with 50 on-line terminals and soon grow to 200. Without Com-plete, it would be impossible to meet this schedule."
Omar Alvarado, Director
Teleinformatica de Mexico

The future is here today with Com-plete. Together with Adabas, Software ag's DBMS, you can have the most powerful DB/DC System in the world, on your 360/370 or compatible computer.

To step into the future, mail the coupon or call our nearest office today.

Corporate headquarters:
Reston, Virginia (703) 860-5050.
New York (212) 682-2780.
Chicago (312) 298-4134.
Miami (305) 989-4814.
Houston (713) 444-2651.
Detroit (313) 354-0424.
San Francisco (415) 332-3890.
Los Angeles (714) 494-8410.
Cambridge, Ontario (519) 653-6142.
Mexico City (905) 550-8033.

software ag
OF NORTH AMERICA, INC

Software ag of North America
Reston International Center, 11800 Sunrise Valley Drive
Reston, Virginia 22091

☐ I'd like Com-plete information.
☐ Please send information on Adabas.
☐ Let's arrange a presentation.

Name _____ Company name _____
Street _____ City _____
State _____ Zip _____ Phone _____
Type of computer _____ Operating system _____

51

Worldwide support

Member SIA

BLIS/COBOL
MULTIUSER OPERATING SYSTEM
SELLS MINI SYSTEMS
For information call today...
IPI MINICOMPUTER SOFTWARE
Phone (305) 647-2200 USA
TWX/Telex 810-853-5033
1850 Lee Rd., Winter Park
(Orlando), Florida 32789

COMPUTERWORLD

. . . the one weekly newspaper that's designed to fulfill your unique "need to know". . . the one newspaper that can give you all the current information you need to benefit you, your organization and your career progress . . . 52 weeks of incisive news, commentary and special reports . . . subscribe today, use the attached postage paid order form.

☐ *Please enter my subscription*
(details on back)

☐ *I'm already a subscriber, but I'd like you to change my:*
- ☐ *address*
- ☐ *title*
- ☐ *industry*
- ☐ *other*

My current mailing label is attached and I've filled in new information on the other side

Put old label or label information here

Please send me **COMPUTERWORLD** for one year. RATES: United States – $18 Canada and PUAS – $28
Europe and Near East — $75 All Other Foreign — $125

☐ Check Enclosed
☐ Am Ex ☐ BA/Visa ☐ MC (MC Only - List four digits above your name)

If charge we must have cardholder's signature: _____ Expiration Date: _____

First Initial		Middle Initial		Surname			
Your Title							
Company Name							
Mail To:							
City					State		Zip Code

Address shown is:
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld*.

☐ Check here if you're interested in receiving information on *Computerworld's* Index.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT. 797 Washington Street, Newton, Mass. 02160

Detach here, fold, and place in post-paid envelope attached through binding.

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

BUSINESS/INDUSTRY
10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other: _____

TITLE/OCCUPATION/FUNCTION
11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/ Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other: _____

Calendar

May 10, Bloomington, Minn. — **Region IV Conference**, sponsored by the Data Processing Management Association (DPMA). Contact: Northwest Chapter DPMA, Box 9566, Minneapolis, Minn. 55440.

May 24-25, New York — **Telecommunications Networking Strategies for Distributed Processing Applications**, sponsored by The Yankee Group. Contact: Kate Cogswell, The Yankee Group, Harvard Sq., P.O. Box 43, Cambridge, Mass. 02138.

June 1-2, Arlington, Va. — **Managing Tomorrow's Information Technology: The Key to Improved Government Operations**, sponsored by the Federal ADP Users Group. Contact: USPDI, Conference Manager, 719 N. Belgrade Road, Silver Spring, Md. 20902.

June 1-3, Los Angeles — **A History of Programming Languages Conference**, sponsored by the Association for Computing Machinery's Special Interest Group on Programming Languages. Contact: Rorrie Ratkevich, Ground Systems Group, Hughes Aircraft Corp., 1901 W. Malvern, Mail Drop 606-K126, Fullerton, Calif. 92634.

June 5-6, New York — **Software Management Conference**, sponsored by American Institute of Aeronautics and Astronautics (AIAA). Contact: AIAA Conferences, Suite 1010, 5959 W. Century Blvd., P.O. Box 91295, Los Angeles, Calif. 90009.

June 5-7, Chicago — **Pattern Recognition and Image Processing Conference**, sponsored by the Institute of Electrical and Electronics Engineers (IEEE). Contact: IEEE, P.O. Box 639, Silver Spring, Md. 20901.

June 5-7, Chicago — **Computer Performance Measurement: Tools and Techniques for Increased System Productivity**, sponsored by Datapro Research Corp. Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also in New York June 7-9.

June 5-7, Chicago — **Data Base Management Systems: A Comparative Analysis**, sponsored by Datapro Research Corp. Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also in Philadelphia June 28-30.

June 5-8, Anaheim, Calif. — **National Computer Conference**, sponsored by the American Federation of Information Processing Societies (Afips). Contact: Afips, 210 Summit Ave., Montvale, N.J. 07645.

June 5-9, Atlanta — **Manual Systems: Fundamentals of Analysis and Design**, sponsored by American Management Associations. (AMA). Contact: AMA, 135 W. 50th St., New York, N.Y. 10020.

June 7-9, Washington, D.C. — **Applied Data Communications Systems**, sponsored by the Institute for Professional Education (IPE). Contact: IPE, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

June 7-9, Philadelphia — **Effective Computer Operations Management**, sponsored by Datapro Research Corp. Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran N.J. 08075. Also being held June 19-21 in New York and June 26-28 in Washington, D.C.

June 7-9, New York — **Data Base Management Systems: General Concepts and Planning Guidelines**, sponsored by Datapro Research Corp. Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held June 21-23 in San Francisco and June 28-30 in Washington, D.C.

June 7-9, Philadelphia — **Word Processing: Guidelines for Planning, Design and Implementation**, sponsored by Datapro Research Corp. Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held June 14-16 in Los Angeles and June 28-30 in Washington, D.C.

June 7-9, Chicago — **Data Processing: An Introduction to Concepts and Systems**, sponsored by Datapro Research Corp. Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held June 21-23 in Washington, D.C.

June 8-9, Washington, D.C. — **Data Communications: Advanced Concepts and Systems**, sponsored by Datapro Research Corp. Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held June 21-23 in Chicago.

June 8-9, Philadelphia — **Minicomputers and Microcomputers: Selection and Usage Guidelines**, sponsored by Datapro Research Corp. Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held June 22-23 in Los Angeles.

June 12-14, New York — **DP Project Management: A Practical Approach**, sponsored by Datapro Research Corp. Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held June 26-28 in Los Angeles.

June 12-14, Denver — **Ninth Conference on Computers in Undergraduate Curricula**, sponsored by the University of Denver. Contact: Dr. William Dorn, Department of Mathematics, University of Denver, Denver, Colo. 80208.

June 12-16, Helsinki, Finland — **Seventh Triennial World Congress**, sponsored by the International Federation of Automatic Control (Ifac). Contact: Ifac 78 Secretariat, POB 192, 00101 Helsinki 10, Finland.

June 13-15, Zurich, Switzerland — **Minis and Microcomputers and Their Applications and Computers in Banking (Mimi 78)**. Contact: Interconvention Congress and Convention Services Ltd., c/o Swissair, 8058 Zurich, Switzerland.

June 14-16, Washington, D.C. — **Linear and Nonlinear Model Fitting**, sponsored by the Institute for Professional Education (IPE). Contact: IPE, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

June 15, Gaithersburg, Md. — **Reorganization of Federal Data Processing**, sponsored by the National Bureau of Standards. Contact: Charles Bridges, 151 Fleetwood Terrace, Silver Spring, Md. 20910.

June 18-20, Barcelona, Spain — **Computer Data Security Using Commercial Cryptographic Technology.** Contact: Charlene Woolard, Ketron, Inc., Valley Forge Executive Mall No. 10, Wayne, Pa. 19087.

June 18-22, Dallas — **1978 Government Management Information Sciences National Conference**. Contact: Charles L. Collier, Director of Data Services, Dallas County, 504 Records Building, Dallas, Texas 75202.

June 19-21, Atlanta — **10th National Data Processing Security Seminar,** sponsored by Data Processing Security, Inc. Contact: Jon Allen, Program Director, 235 N.E. Loop 820, Hurst, Texas 76053.

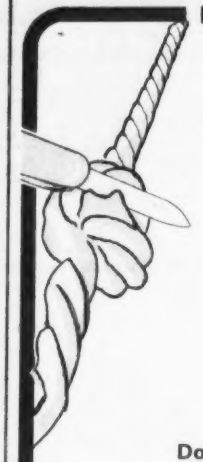
June 19-21, Las Vegas — **Fifteenth Design Automation Conference**, sponsored by the Association for Computing Machinery (ACM) and the IEEE Computer Society. Contact: ACM, 1133 Ave. of the Americas, New York, N.Y. 10036.

June 20-22, Geneva, Switzerland — **International Microcomputers/Minicomputers/Microprocessors '78 Conference,** sponsored by Industrial & Scientific Conference Management, Inc. (ISCM). Contact: ISCM, 222 W. Adams St., Chicago, Ill. 60606.

June 20-23, Barcelona, Spain — **First World Computing Services Industry Congress**, sponsored by Association of Data Processing Service Organizations (Adapso), European Computing Services Association and Japan Software Industry Association. Contact: Adapso, 210 Summit Ave., Montvale, N.J. 07645.

June 21-23, Toulouse, France — **Eighth International Congress on the Operating Reliability of Data Processing Systems,** sponsored by the IEEE Computer Society of New York. Contact: Comite d'Organisation du FTCF-8, 7, Avenue du Colonel Roche, 31400 Toulouse, France.

The CW Calendar generally appears in the first and second issues of each month, and events are listed a month in advance. All conference announcements should be sent to Calendar, CW Editorial Department, 797 Washington St., Newton, Mass. 02160, at least six weeks prior to the month in which the event is slated to occur.



NEED A CONSULTANT?

EDP Consultants Can Advertise Services and Prices

Organization or Financial Analysis Small to Medium-sized Business	**$1,500**
Business Plan Analysis Single Product Line	**$1,000**
Business Plan Formulation Single Product Line	**$3,000**
Evaluation: Which Small Business System Should I Buy?	**$ 600**
Recruitment and Qualification of Dealer or Distributor: Domestic	**$1,500**
Foreign	**$3,000**
Executive Recruitment	**$6,000**
Executive Disengagement and new Career Pathing	**$6,000**
Domestic or Overseas Market Analysis Single Product, Per Country	**$1,500**
Consultation (1 hour)	**$ 20**

Add to the above, communications and travel costs. Other prices on request.

For further information, please call:

ARINCO
105 E. Marcy, Suite 112
Santa Fe, New Mexico 87501
(505) 988-9743

Art Rubino
President

To All Personnel Concerned With Computers

A ONE-DAY SEMINAR ON

COMPUTER SECURITY

DATA PRIVACY, FRAUD, AND INTEGRITY

Featuring:

Donn B. Parker
SRI International
Author of Crime by Computer

Speakers:
Daniel G. Cooper, Chairman, Barrister and Solicitor
Robert H. Courtney, IBM Corporation
Stanley Goldstein, Department of Justice
Laurie K. Nichol, C.A., Thorne, Riddell & Co.

MONTREAL/May 16
Guest Speaker
George F. Sekely,
Canadian Pacific Limited

TORONTO/May 17
Guest Speaker
Rep. Barry M. Goldwater, Jr.
Member of Congress

OTTAWA/May 18
Guest Speaker
Ms. Inger Hansen
Canadian Human Rights Commission

Registration

Mail to:
Canadian Professional Conferences
P.O. Box 37
Postal Station D
Toronto, Ontario Canada M6P 2K7
OR CALL (416) 537-5481

Montreal: Lowes La Cite Hotel
Toronto: Holiday Inn-Downtown
Ottawa: Chateau Laurier Hotel
Call hotels directly to arrange for overnight accommodations. A block of rooms is being held on a first come/first served basis.

Please invoice us/enclosed is our cheque for the following registrants, in the amount of $, payable to CANADIAN PROFESSIONAL CONFERENCES. I/we have indicated at which location I/we wish to attend the seminar. (Individual $145.00; Team of 3 from same organization $350.00).

This covers the cost of the conference, cocktails, luncheon and book.

Name_____ Title_____
Name of Organization_____
Address_____ Telephone_____
City_____ Province_____
Postal Code_____

IN DEPTH

IN DEPTH

IN DEPTH

IN DEPTH

SBS: Catalyst For Action

By John Gantz

IN DEPTH

A decade after its inception as CML Satellite Corp., the entity now known as Satellite Business Systems (SBS) will begin beaming voice, computer and video information through the U.S. skies. Although the technology won't be radically new, the system capacity particularly great or the service unopposed by competitors — SBS is nonetheless unique for two reasons.

For one, it portends *new* applications of high-speed data transfer. Voice usage, a mainstay at first, will diminish in its share of the bit stream as teleconferencing, electronic mail, computer load-sharing and as-yet-undevised applications grow.

For another, SBS is a subsidiary of IBM.

Estimates of Demand

SBS' first users will come from a small coterie of large U.S. companies with immense long-haul voice and data traffic and multiple remote locations. As its target market, SBS chose 415 companies from the Fortune 500 and various Fortune 50 listings (800 companies) and set about to estimate demand.

Detailed case studies were made on 16 of the companies chosen and, after examination, the data on them was extrapolated to find the total market demand for satellite services among large commercial users.

From those studies came the SBS estimates of earth station and satellite voice-equivalent circuit demand presented to the Federal Communications Commission (FCC) in an April 16, 1976 amendment to its original filing of December 22, 1975. These are admittedly conservative estimates of demand.

After its initial 16-company market study, according to an article in the June 1977 issue of *Fortune*, SBS went to another 16 companies in its target market of 415 and performed some specific network analysis. Although SBS is close-mouthed about the results of these studies, *Fortune* reported the company's methodology was this: First, current customer data, mail and voice traffic and executive travel was analyzed; second, projections were made to 1979; finally, computer routines were used to determine the savings an SBS service of a particular configuration and traffic penetration could provide.

The "hard" savings reportedly turned out to be not so great — most companies have relatively few routes with enough traffic to support satellite use. Three of the studies showed only 15% to 20% of the companies' traffic would be eligible for SBS takeover, with savings at less than 5% of total communications costs.

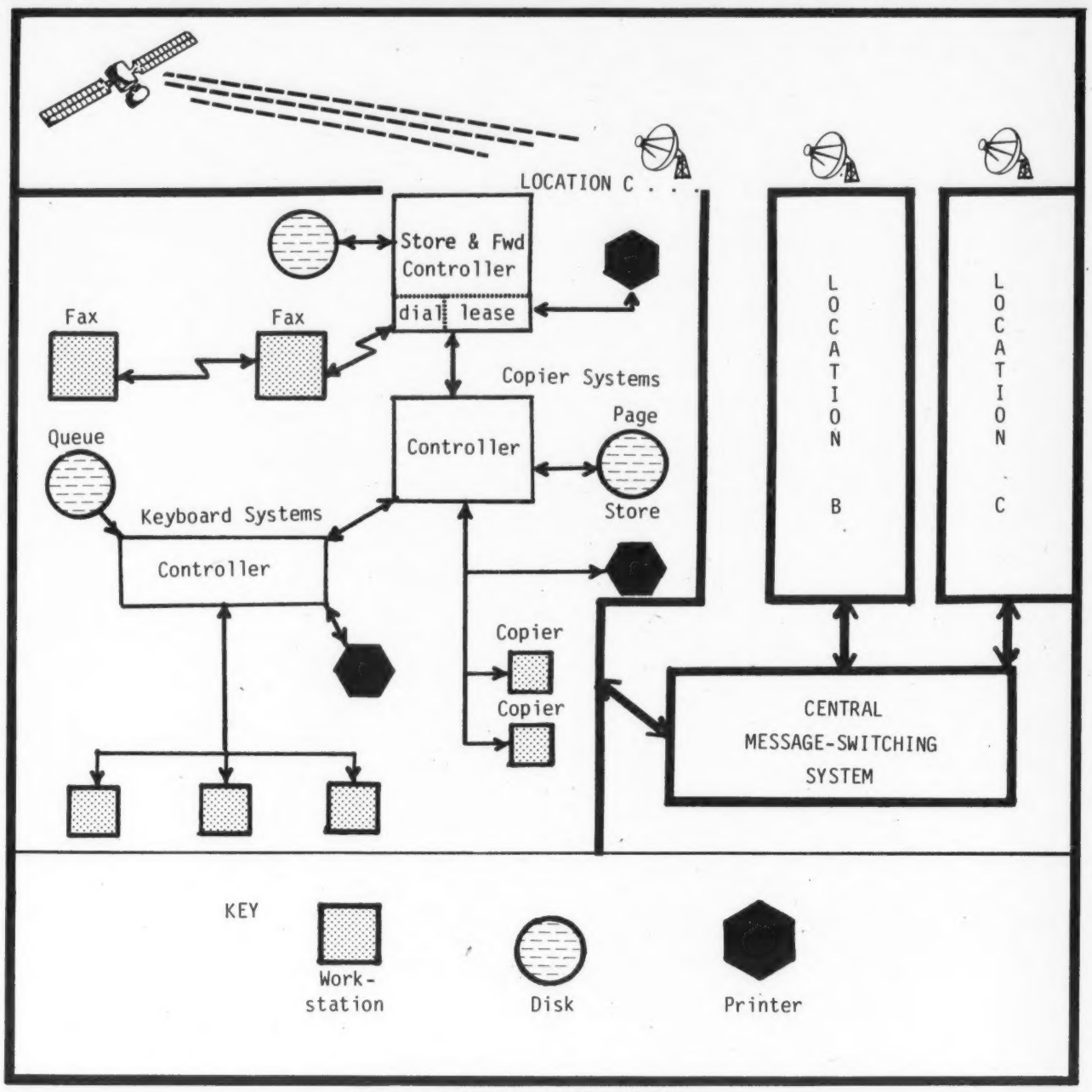


Figure 1. A Hypothetical Total SBS System

SBS will therefore look to new applications to spur demand and, in fact, the company has been quite candid in admitting its success will lean heavily on them. SBS spokesmen talk of "acting as the catalyst" in generating new applications.

To buoy their contention that users will be ready to implement the new applications by the time its satellites are aloft, they cite the prevalent industry statistics on the growth of data terminal installations and the overall growth of data communications.

The total business communications market, for instance, grew from $14 billion in 1965 to $31 billion in 1974. It will reach $61 billion in 1980 and total more than $100 billion by 1985.

Emergence of Hybrids

The new applications SBS sees its system fostering feature the integration of separate communications systems now at hand and the emergence of hybrids. Today's labels for what might develop include electronic mail, teleconferencing and high-speed computer-to-computer communications (file transfer, load sharing, "virtual channels").

Typical equipment involved would include facsimile devices, store-and-forward controllers, image storage devices, remote copiers, satellite delay compensators, wall screen TVs, freeze-frame video devices, etc.

To foster the development of these new applications, SBS is proceeding along a two-fold path — explaining SBS possibilities to equipment manufacturers in hopes of spurring product development and educating users to the "soft" savings inherent in the new applications. Three specific examples of the new applications SBS hopes to nurture follow.

The technology is not particularly new or unique, but Satellite Business Systems promises to spur a new world of applications. In this chapter from an International Data Corp. Special Report, the author tells why.

IN DEPTH

IN DEPTH

IN DEPTH

IN DEPTH

IN DEPTH

On a sleepy Independence Holiday in July 1974, IBM surprised most of the industry by announcing intentions to make its first corporate acquisition in over a decade. The purpose of the acquisition would be to enter the domestic satellite communications business, recently opened to competition by the Federal Communications Commission.

Today that intention has been realized by IBM's partnership in Satellite Business Systems (SBS), a descendant of CML Satellite Corp. CML was formed as a joint venture in 1971 by MCI Communications Corp., Lockheed and Comsat General Corp.; IBM bought out MCI and Lockheed.

Under an FCC order, IBM and Comsat took in a third SBS partner. That partner is Aetna Casualty and Surety Co., a subsidiary of Aetna Life.

SBS' filings with the FCC proposed a switched digital system for private-line (intracompany) transmission of voice, data and image. It is a system with significant differences from today's commercial satellite systems:

• The SBS system will use a higher-than-normal frequency for transmission, permitting the use of smaller rooftop, courtyard and parking lot antennae. These, in turn, will reduce the need for local or regional terrestrial loops.

• The SBS system will be all-digital, even for video transmission. By using time-division multiple-access techniques, it will allow users to adjust dynamically their network capacity to meet changing traffic patterns.

• The initial system will feature two satellites aloft and one spare on the ground. It s initial capacity will be I/O transponders capable of 43M bit/sec . . . about the equivalent of 12,000 to 14,000 voice circuits.

• The unattended earth stations will each house, in addition to the necessary transmit/-receive radio frequency equipment, a burst modem and a communications controller. The latter, made by IBM, will act as an intelligent interface between the user's and SBS' networks.

SBS expects to be one of the first commercial users of the National Aeronautics and Space Administration's (Nasa) Space Transport System (The Space Shuttle), with launch scheduled for the summer of 1980 and commercial start-up in 1981.

One of SBS' early marketing, research and user education efforts has been Project Prelude, a three-month experiment held last year in which actual SBS-type applications were tested on the Nasa/Canadian CTS satellite. More experiments have ensued and more are bound to follow.

This year SBS will report its first operating income — from preoperational services supplied to IBM for testing purposes.

ELECTRONIC MAIL

Among its 16-company studies, SBS looked at the potential for electronic mail — electronic store-and-forward systems for *intra*company information distribution. In its workstation surveys, SBS' Tom Rush said at a Yankee Group seminar last year, the following statistics were unearthed:

ORIGIN

40% = Documents Handwritten
40% = Documents Typed
13% = Documents Dictated
6% = Documents Self-Composed
1% = Documents From Dictating Equipment

PROCESS

50% Documents = Letter/Memo
35% Documents = Forms
10% Documents = Messages
5% Documents = Reports

From 50% to 80% of the documents could be captured in electronic form; 20% to 50% were facsimile-eligible. Fifteen percent exhibited special characteristics and were ineligible for capture.

As for company mail overall, SBS found 50% of all mail was *inter*company (first class and priority). Forty percent (first class and priority) was *intra*company, 10% fell into other categories. Eighty-six percent of *intra*company mail was considered "satellite-eligible."

According to SBS scenarios, an electronic mail system (Figure 2) could evolve along three convergent lines:

• Separate facsimile systems evolving into clustered systems, then to store-and-forward systems with disk on the controller. (Systems like the recently announced Graphic Sciences, Inc. Dex-5100 already have some rudimentary store-and-forward and copier capabilities.)

• Keyboard document systems (IBM magnetic card) evolving to clustered systems with controller and storage replacing separate magnetic card files. Text editing and high-speed printing could be added, however, thanks to the increased intelligence of the controller.

• Disparate copier systems evolving along the same controller/storage route . . . adding electronic collating and reduction/enlargement. Scanning becomes a one-shot occurrence, and magnetic card units can become input devices to the copier controller.

Eventually these systems could be interconnected, especially the distributed fax units to the copiers and the keyboard systems to one another. Such interconnections allow the removal of redundant equipment — extra magnetic card units and printers — and provide the advantages of an integrated in-house system.

Once the in-house systems are in place, the next step is to interconnect separate locations within a company. Presto, the copier/fax/word-processing system becomes an electronic mail system.

TELECONFERENCING

Another application, also with facsimile as an important ingredient, is the replacement of executive travel (and jet lag, lost time, etc.) through the use of a mix of video and audio equipment: teleconferencing. At its simplest, teleconferencing is a basic conference phone call; at its most complex, it can include full-color motion video, image storage and retrieval, high-speed facsimile and remote computer access.

Most teleconferencing will probably stress the hard-copy transferral and freeze-frame video over full-motion TV since bandwidth requirements — and hence costs — are much less for still-frame and limited-motion transmission. (Figure 3).

The devices SBS envisions being used in a teleconferencing set-up — based on current teleconferencing systems and current on-the-shelf technology — include:

• **Document scanner** — makes up the input half of one of today's fax units. Scanners, which would have to operate at less than .5 sec/page, scan full pages and possibly come equipped with multiple page feeders or open-scan capability, would drive the hard-copy applications. They could also be used in lieu of TV cameras.

• **Document data processor** — processes scanner signals and reconstructs received facsimile signals. A major

(Continued on Page 26)

IN DEPTH

(Continued from Page 25)

function of the data processor is to compress scanner signals — at a ratio of 10:1 — with an I/O data rate of 10M bit/sec and compressed data rate of 500 kbit/sec. Document processors currently operate as subsystems in fax units (and the needed compression ratios exist, although they have their price).

•High-resolution image display — displays detailed documents and information encoded by the document scanner. Although 1,000- to 2,000-line graphic resolution is currently under development, future component technology is uncertain. SBS sees teleconferencing as an impetus.

•Hard-copy printer — a memory-driven printer to provide hard-copy on demand from images displayed or stored on the TV display, high-resolution image display or teleconferencing storage media; also to be used with the document scanner for local printing. Throughput required, according to SBS: 1 page/sec.

•Digital video encoder/decoder — the analog-to-digital and digital-to-analog converter and compression/reconstruction device. Input could also come from a standard TV camera. For motion video, these units must operate at 6.3M bit/sec. Full-motion systems are still under development (still-frame systems are available today), and compatibility problems also exist.

•Multi-frame image storage — a random-access, 1- to 2-sec retrieval device for freeze frames, full-motion stills or document data. Currently, available devices include digital disk packs, analog video disks and micrographic units.

•Wall displays — TV screens along the lines of the Advent Corp. entertainment model, perhaps with larger screen sizes and better resolution. Cost is still a major hurdle, with $10,000 per unit an SBS goal.

•Conference console — the nervous system for the teleconferencing center. An alphanumeric display and standard equipment interfaces would be needed. All the required hardware is available today, although international standards and lower costs would be advantageous.

•Image storage and refresh/display — would drive the TV display and/or high-resolution image display and the hard-copy printer and provide interim storage for the image data processor. It would need to store three images at up to 3.8M bits and provide compatible interface speeds for real-time conferencing. A megabit product is currently available in the $2,000 to $5,000 range; future memory devices for individual workstations at less than $5,000 are desirable.

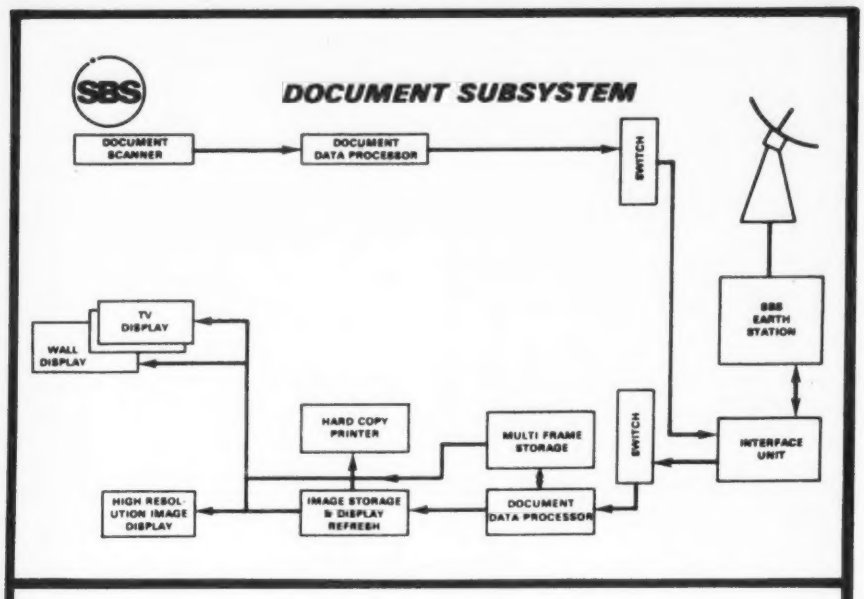
Teleconferencing applications are not new. The Department of Defense installed a system as early as 1959; SBS charted at least 15 other systems (not all still in existence) among government, large companies and universities. There are undoubtedly more.

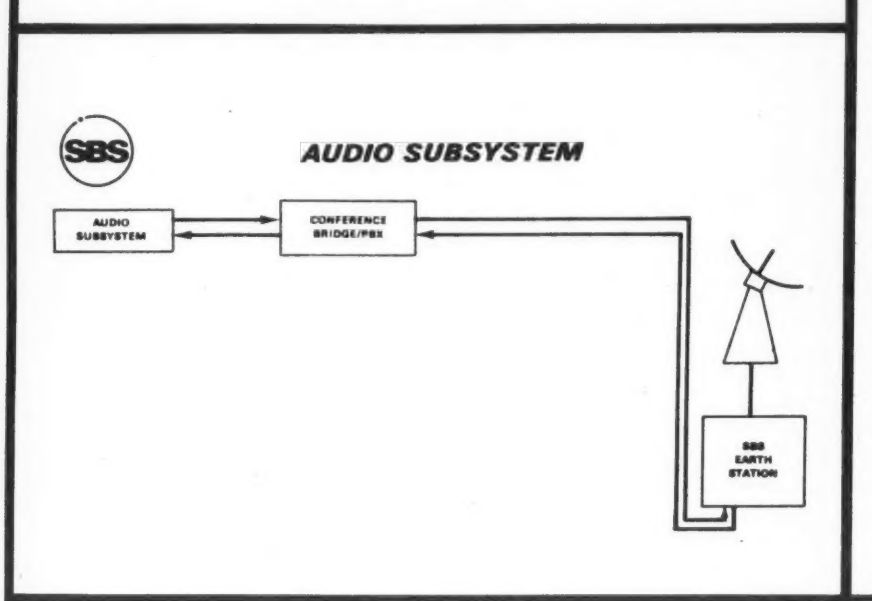
Besides eliminating the cost of some executive travel, teleconferencing has other benefits. Chief among these is meeting flexibility: 10 five-minute meetings cost as little as one 50-minute meeting. Follow-up is reduced ("I'll send that when I get back to the office"), and face-to-face (or at least face-to-still-frame) contact is available to more people.

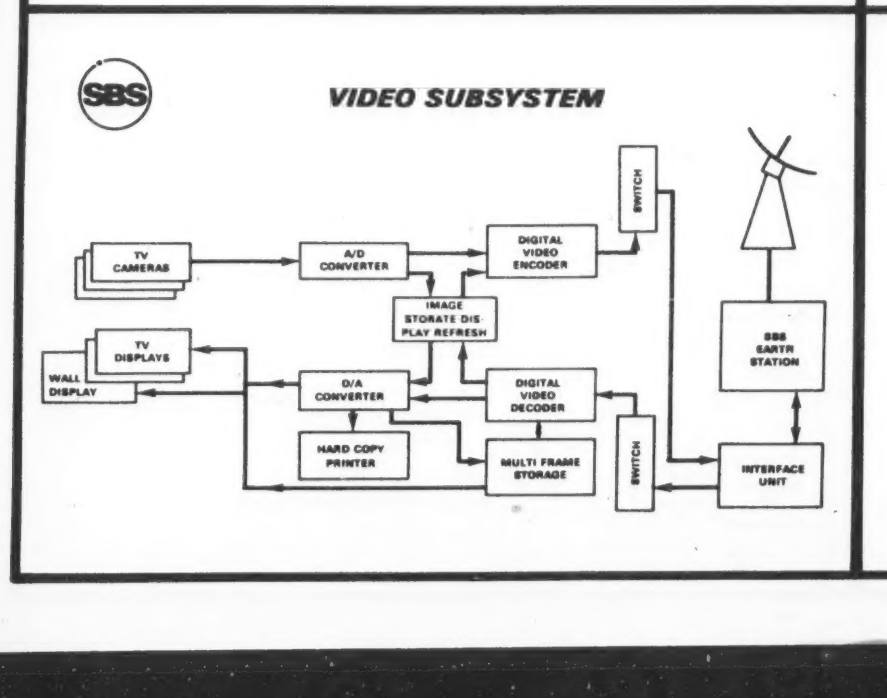
Personal Observations

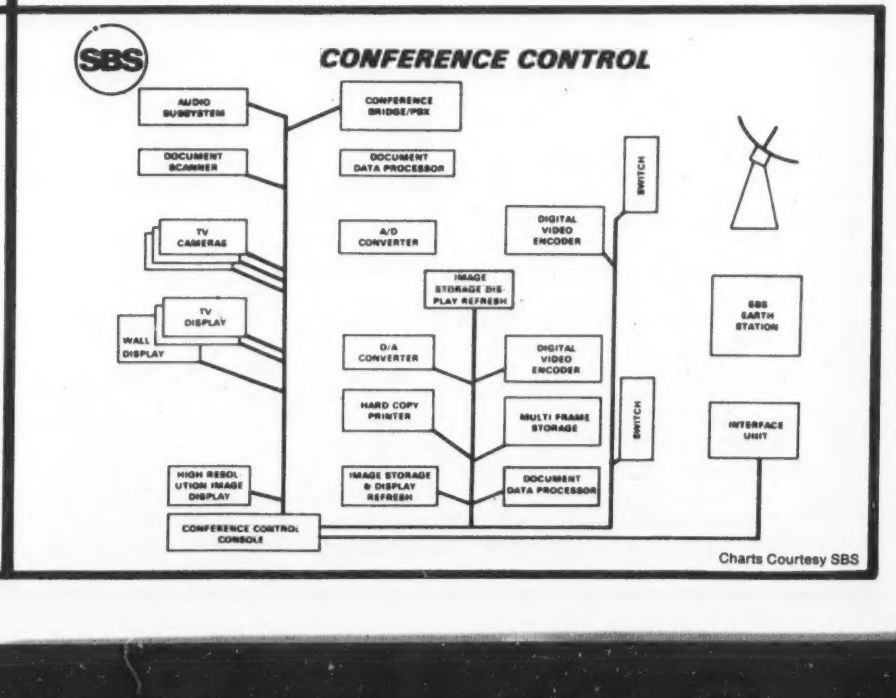
At a Project Prelude session at Texaco's Harrison, N.Y. site last December, I made these observations:

- Despite the sophistication of the users and participants, teleconferencing is still a rough-hewn affair. It's reminiscent of the early days of TV, when the news consisted of pictures of ticker tapes. New applications generic to high-speed digital-fed teleconferencing will probably grow slowly.
- According to SBS studies, teleconferencing works best when the participants know each other and the main objective is problem-solving or straight information exchange. It's appropriate for all management levels and works as well with impromptu meetings as with regularly scheduled ones. It's not suggested, however, for initial contacts, sales, delicate negotiations or personnel appraisals.
- The idea of a teleconferencing service bureau comes to mind...with sessions booked in advance, just as travel currently is, but with cross-country flight and jet-lag eliminated.
- One of the proposed benefits of teleconferencing — the ability to conduct impromptu long-distant visits — may be offset by control hassles over the conference facilities themselves. Which department gets to use the facility when, who authorizes the use, how is abuse prevented? (One of the *advantages* of travel vs. teleconferenc-









Charts Courtesy SBS

Figure 2

ing is the natural prevention of unnecessary trips.) Are the new applications necessary?

• Freeze-frame presentations aren't as weird or disconcerting as one accustomed to watching TV might expect (there's a whole hobby ham radio cult getting into it, by the way).

• Another disadvantage to teleconferencing over travel: equipment failures. And debugging *integrated* systems brings complications of a new order.

HIGH-SPEED COMPUTER COMMUNICATIONS

SBS executives consider high-speed data exchange an area ripe for satellite services. Why? Why satellite communications in the first place? Why not good old terrestrial lines? Several reasons:

• Terrestrial lines are slow, with traffic generally limited to 4,800 bit/sec or less. Faster transmission requires special equipment, line conditioning or the bundling of circuits together. The SBS system will allow traffic at speeds up to 613M bit/sec.

• Land-based communications are necessarily point-to-point; diverse computers linked together would require through connections or links from one computer to another.

• With time-division multiple-access systems, satellites can offer distribution of capacity on a dynamic basis; costs can be allocated according to system usage.

"The implications of these facts," Dr. William Cook, Comsat Labs' manager of computer systems development, wrote in a recent Comsat publication, "are that it may now be economically feasible to consider establishing geographically dispersed networks of large computers communicating with each other at speeds approaching those at which the computers themselves work."

Cook sees advantages in near-instantaneous availability of large data bases at remote locations: "Obvious applications exist in the area of earth resources data collection, banking applications, electronic mail, communications in multinational corporations and organizations, data processing services and information retrieval and archival services."

Symphonie-Based Experiment

In a recent experiment unrelated (?) to SBS, IBM and Comsat hooked together two IBM computers in a 4,000-mile satellite link to test protocols, CPU performance and certain applications under high-speed transmission. The French-German Symphonie satellite was used, with transmission speeds of 1.544M bit/sec.

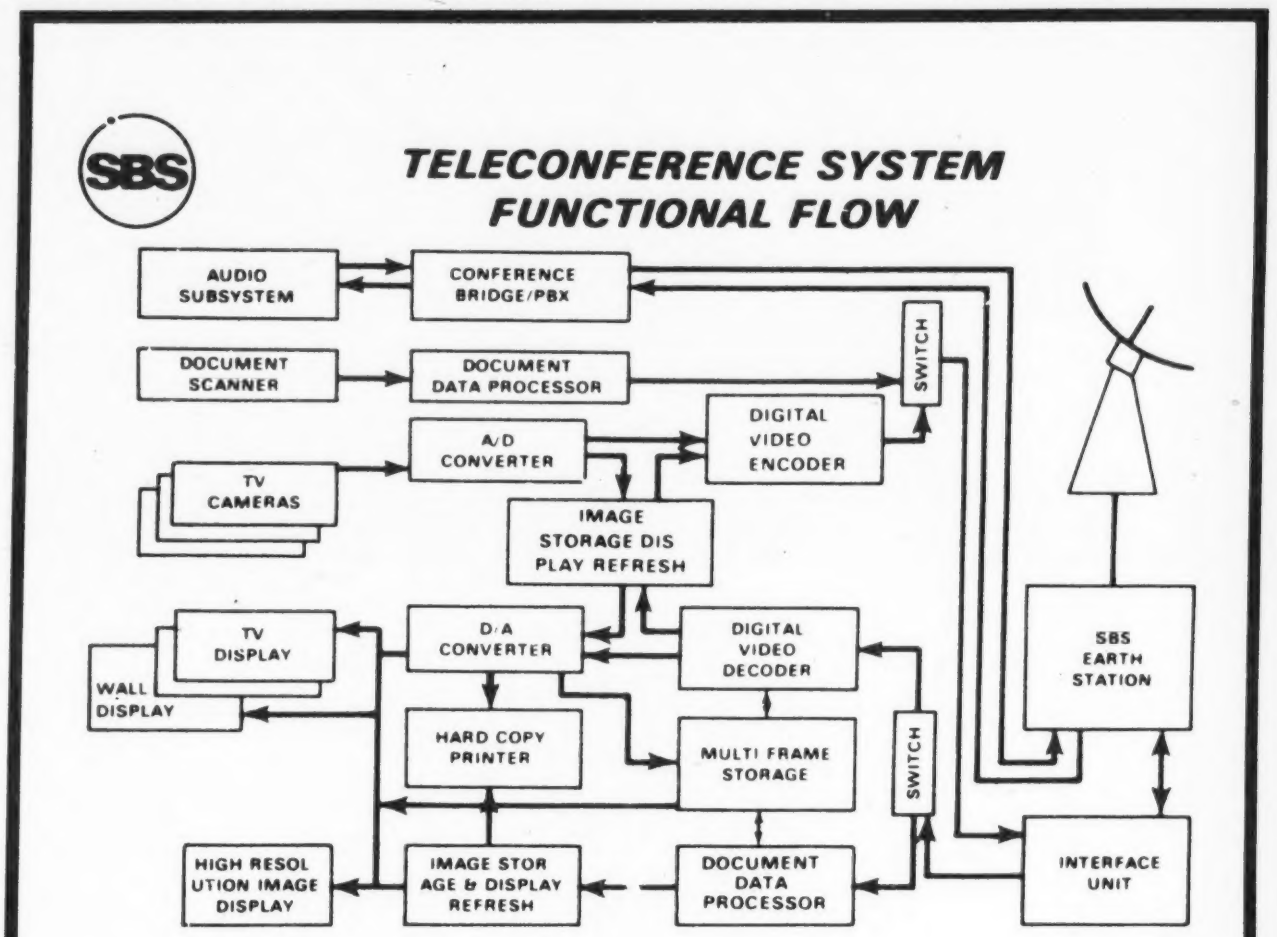
The system put together by IBM and Comsat is diagrammed in Figure 4. The Gaithersburg (Md.) 370/158 was a multiprocessor operating in stand-alone mode, the 158 in La Gaude, France, was a uniprocessor. Both had 2701 front ends which had been modified specifically for the 1.544M-bit transmission.

The modems were modified versions of terrestrial microwave equipment usually used for T-1 (AT&T's digital transmission system which operates at 1.5M bit/sec) channel applications. The Codecs are forward error-correcting devices, used to provide data as error-free as possible to the link.

One earth terminal, a 15-foot diameter rooftop affair which took less than a working day to erect, was provided by Comsat Labs; another was provided by the French postal, telephone and telegraph (PTT) authority and located in a parking lot. Its antenna was 16 feet in diameter.

The Symphonie system consists of

(Continued on Page 29)



The chart above, taken from a slide presented by SBS at its "Product Opportunity Conference" for teleconferencing vendors, depicts a full-blown intracompany system.

Several subsystems, diagrammed on the opposite page, interact to provide the teleconferencing function. Those subsystems include:

- The document subsystem for handling hard copy requirements, including storage and display
- The video subsystem for handling TV and freeze-frame requirements, also including storage and display
- The audio subsystem for transmission of voice traffic
- A control system for integrating the various devices and subsystems that includes a system console

Note that many of the devices serve more than one subsystem, and that lesser teleconferencing systems than that shown are possibile.

Figure 3

Chart Courtesy SBS

INTRODUCING THE NORAND® 101 PORTABLE DATA SYSTEM

The programmable two-way link to your computer

For years it's been a problem... your people compiling field data by hand to be fed into your computer. Or perhaps you simply couldn't find a device to do what you need to do...your way.

That was yesterday. Today, there's the Norand® 101 Portable Data System. It uses an ordinary telephone to send data to...and receive it from...your central computer.

The microprocessor technology built into the Norand 101 makes it totally programmable. Your particular business procedures don't have to change to fit the unit.

Your Norand 101 control program assures the accuracy of the data entered, and the full alphanumeric display guides your people through the program sequences. The display "instructs" your operators in their own language, whether it's cases, pounds, hours, dollars, etc.

Error-free information is stored in solid-state memory, which can be reviewed, changed and updated. It has up to 64,000 character capacity.

An optional wand scanner reads bar codes, to further increase the speed and accuracy of data entry.

Applications of the Norand 101 Portable Data System are virtually limitless. For more information call 1-800-553-5427, Ext. 101... or complete and return the coupon below.

There is a difference.

Telecommunicate over an ordinary telephone. Acoustic coupler shown here.

Optional wand scanner reads bar codes.

NORAND®
COMPUTER SYSTEMS
Norand Corporation, 550 2nd Street S.E.
Cedar Rapids, Iowa 52401
A subsidiary of Pioneer Hi-Bred International, Inc.

Norand Corporation is a full-line manufacturer of point-of-sale systems, in-pharmacy computers and data communications systems.

Please send me more information on the Norand® 101 Portable Data System. I anticipate its use in _____

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY/TOWN _____ STATE _____

ZIP _____ TELEPHONE _____

SBS: CATALYST FOR ACTION

IN DEPTH

(Continued from Page 27)

two telecommunications satellites launched in late 1974 and mid-1975 by the French and German governments. It operates in the 6/4 GHz frequency range, similar to most existing telecommunications satellites (SBS' will operate at a higher frequency).

The data link protocols used were various types of Higher Level Data Link Control (HDLC), with throughput measured on full-duplex and half-duplex transmission under normal and asynchronous response modes. Throughput efficiency of the HDLC protocol is a function of error on the transmission channel, propagation delay, HDLC frame size and the number of frames transmitted at once, response mode, error control technique and type of duplex operation.

Experiment Results

The results of the experiment showed that in achieving maximum throughput, the maximum number of bytes outstanding in the link is the most important parameter . . . *the number corresponds to the minimum buffer size required to store unacknowledged frames of transmitted data.*

With buffers ranging from 105K- to 205K bytes, depending on response modes, virtually error-free throughput approaching full-link utilization can be achieved (a bit error rate of 10^{-6}).

For very small frame sizes — the amount of data sent at once — it was noted CPU time per frame may become larger than frame transmission time.

The CPU time evaluations were based on measurements taken under experimental conditions, Comsat cautioned, and were affected by the experimental nature of the software used. That experimental software provided data collection capabilities far beyond the requirements of a practical user and thus isn't representative of the "real world." The results *were* used to compare HDLC formats.

There are two major contributors to CPU time: 1) the time required for HDLC protocol control functions, and 2) the time required to transfer the information content, which is proportional to the frame size. The experiment determined that the first of the two factors predominates.

Although IBM's and Comsat's plans were to assess the potential benefits of satellite transmission for certain computer applications — with measurements planned for interactive user response times, remote job entry, tape-to-tape transfer delays and load-sharing data set exchange delays — the test period was shortened and only the tape transfer tests (simulated high-sped fax transmissions) were made.

Comsat and IBM have now petitioned the FCC for permission to conduct a second phase of the Symphonie experiment, with a third earth station to add networking complexity.

Hurdles to Overcome

The hurdles to computer-to-computer communications via satellite can be summarized this way:

- Telecommunications protocols will have to be revised to allow for the propagation delay.
- Earth station costs so far are still high enough to preclude true multipoint setups.
- Interconnect equipment will have to be devised to handle protocols, timing, encryption and CPU-to-earth station connections.
- Terminals connecting directly to the earth station will also need some modification, according to SBS.
- Longer data block transmissions — needed to prevent error and acknowledgment protocols from throttling throughput — will require large buffer capacities. Mini-computer based nodes may be the answer.

For high-speed computer-to-computer communications to be *most* effective, according to SBS, direct channel-to-channel — or "virtual channel" — connections between remote computers will be required. These would avoid a lot of telecommunications overhead and allow dynamic transmission. But, at the least, large-scale data transfers will be facilitated by the higher bit rates.

For instance, a data base transfer that previously took several hours could take only three minutes. Such data base transfers would allow the establishment of regional — but completely up-to-date — data bases for cheaper local access.

A CONCLUSION

So far the satellite business has been an unprofitable one. Last year none of the carriers made a profit on an aggregate revenue base of $50 million to $60 million. This year it will be touch-and-go. On the historical side of it, SBS has a tough row to hoe.

The new applications will have competition, too. Bell's Advanced Communications system and the packet-switching specialized carriers will vie for data traffic; ITT, Southern Pacific Communications and the Graphnet Fax networks will compete in the electronic mail business; and the broadcast companies may well get into teleconferencing.

There's also plain old resistance to change:

- While high-speed fax is possible, vendor offerings are currently a hodge-podge of incompatible systems — even those under the same nameplate. With customer bases to protect, the established vendors may not be wont to introduce brand-new products.
- In high-speed data, how big a market for satellite-specific front-end processors must there be to generate new products? Will users just getting into minis and distributed processing want to centralize again, albeit with regional hosts?
- Will businesspeople really want to give up a chance to get away from the everyday routine . . . or at least, can they do without the personal contact denied by teleconferencing?

Addressing this resistance to change, RCA President Edgar H. Griffiths said to a group of security analysts in New York last November, in talking about RCA America's losses, "You might ask, 'Why hasn't the satellite become instantly or almost instantly profitable?' The answer appears to be that it is a new technology, and it isn't easy for a new technology to be accepted. It is going to take some time.

"In addition, there has been some very aggressive counterpricing by the Bell System on its land lines. We have a deep feeling that the satellite business will become profitable and that it will

(Continued on Page 30)

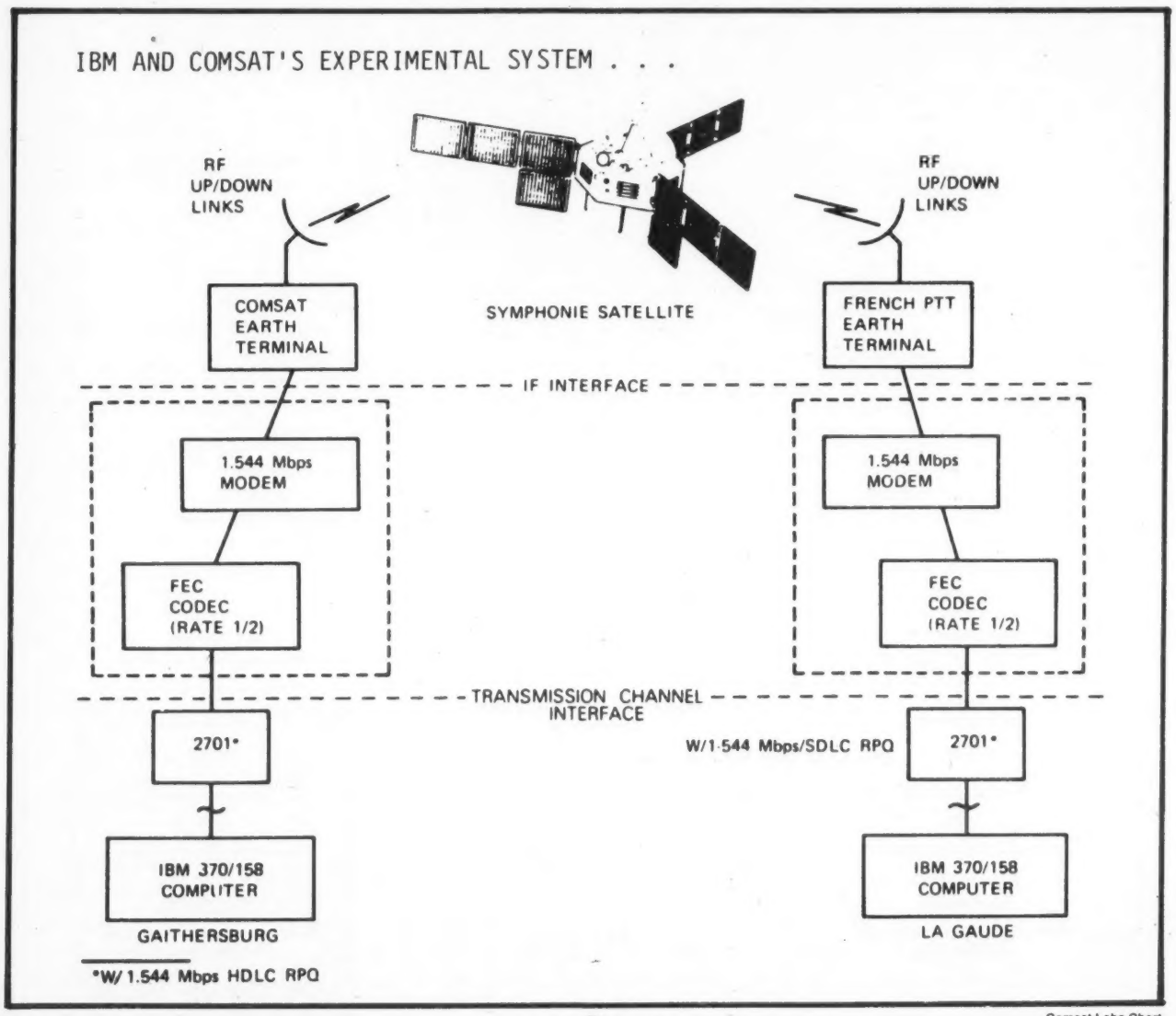


Figure 4

Comsat Labs Chart

To each his own.

Get off the routing list and on to the subscriber list.

CIRCULATION DEPT.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

797 Washington St., Newton, MA 02160 • (617) 965-5800

SBS: CATALYST

IN DEPTH

(Continued from Page 29)

become a vast business. It is simply taking longer."

Will SBS succeed? Probably. Behind the company is the financial muscle of its parent companies — not to mention their business. It's been estimated that IBM and Aetna could eat up a fourth of SBS' initial system capacity.

Behind the company is also the momentum of all that data communications growth. Aetna and SBS are now conducting experiments in teleconferencing using the Nasa-Canadian CTS satellite.

Other satellite carriers are hoping to make it with less innovative programs (this generation). All expect to be in for the long haul. And SBS initial target of 375 earth stations to pay for system costs is modest.

Will SBS succeed beyond this modest dream? That's another question.

CW Photo by R. Frank

John Gantz is one of the founders of the Distributed Processing Reporting Service and editor of "Distributed Processing Newsletter" at International Data Corp. (IDC) in Waltham, Mass. The former managing editor of "EDP Industry Report," he participants in IDC seminars and custom research projects in data communications and distributed processing.

Prior to joining IDC, Gantz was a freelance writer on topics ranging from the optical system of Polaroid's SX-70 camera to backpacking on the Appalachian Trail. He is a former officer on nuclear submarines and holds an A.B. from Dartmouth College.

A complete copy of "Satellite Business Systems: A Special Report" is available for $90 through Mary Trayte at IDC's Distributed Processing Reporting Service, 214 Third Avenue, Waltham, Mass. 02154.

NCC '78 THE RECORD BREAKER

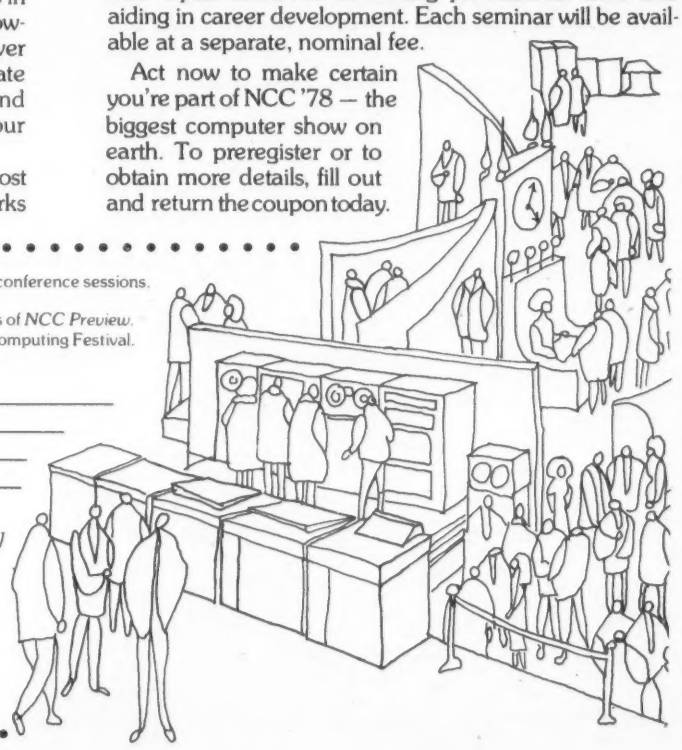
The 1978 National Computer Conference, June 5-8 in Anaheim, promises to be the largest and most diverse computer conference and exposition ever held. NCC '78 will combine the biggest with the best with a number of new NCC records expected... the largest exhibit of computer products and services ever held; total conference attendance of up to 40,000 computer specialists and information processing users; plus a Personal Computing Festival which will provide a unique national forum for this fast-growing field.

NCC '78 will be a rewarding learning experience for anyone with a need to know about the latest developments in computing and information processing. The conference exhibit program will be the largest single display of computer hardware, software, systems, and services ever staged. All exhibit space for NCC '78 is sold out, with more than 330 organizations reserving 1,382 booths — surpassing the previous record of 1,146 booths set at the '77 NCC in Dallas. More than ever, NCC will be an extraordinary showcase for the latest developments in computing with over 4,000 industry representatives on hand to demonstrate their latest products and services, provide technical and commercial data, and to help you find solutions to your specific needs.

The Personal Computing Festival will be the most exciting event of its type ever held. The Festival marks a first for NCC — a major conference-within- a- conference with its own program of approximately 30 sessions, commercial exhibits of consumer computer products and services, and a contest featuring "homebrew" microprocessor systems, devices, and applications. All Personal Computing Festival activities will be held in the Disneyland Hotel Convention Center, just a few minutes from the Anaheim Convention Center.

And there's much more. A technical and professional program of some 100 sessions will cover new frontiers in computer methodology, applications, systems, and societal concerns with emphasis on practical applications and current issues rather than on theoretical concepts. Special attention will be given to how the use of computers can help alleviate the national energy problem. In addition, a Professional Development Series of 15 seminars will feature topics critical to increasing professional skills and aiding in career development. Each seminar will be available at a separate, nominal fee.

Act now to make certain you're part of NCC '78 — the biggest computer show on earth. To preregister or to obtain more details, fill out and return the coupon today.



☐ I wish to preregister for NCC '78 and have enclosed $60 covering conference sessions, exhibits, other activities, plus preregistration benefits.
☐ Please send me all the facts about NCC '78, including future issues of *NCC Preview*.
☐ My company is interested in exhibiting at the NCC '78 Personal Computing Festival.
☐ Please send me information about the NCC '78 Travel Service.

Name _____
Company _____
Street _____
City _____
State _____ Zip _____

CPTW

NCC '78...
New Frontiers in Information Processing
c/o AFIPS, 210 Summit Avenue
Montvale, N.J. 07645
telephone: 201/391-9810

Texas Instruments
Portable Data Terminals
FOR SALE
• 743 • 745
BEST PRICE • FAST DELIVERY
CALL TOLL FREE 800-323-2288
IN ILL. CALL 312-279-1960
Data Equipment Group
ICE, INC.
772 N. Church Rd.
Elmhurst, Ill. 60126

(Advertisement)

(Advertisement)

NATIONAL —SPECIAL LEAR SIEGLER ISSUE—

INFORMER

PYRAMIDS BUILT BY APACHES!

May 1, 1978

RUMORED TO BE PART OF PROJECT X:

HUGE SHIPMENT HEADED FOR NCC?

Lear Siegler— A Leading Independent Terminal Manufacturer *Page 4*

★ ★ ★

Committee Stalemated On Project X Decision As NCC Draws Near *Page 16*

★ ★ ★

Project X Canisters Leaking *Page 11*

★ ★ ★

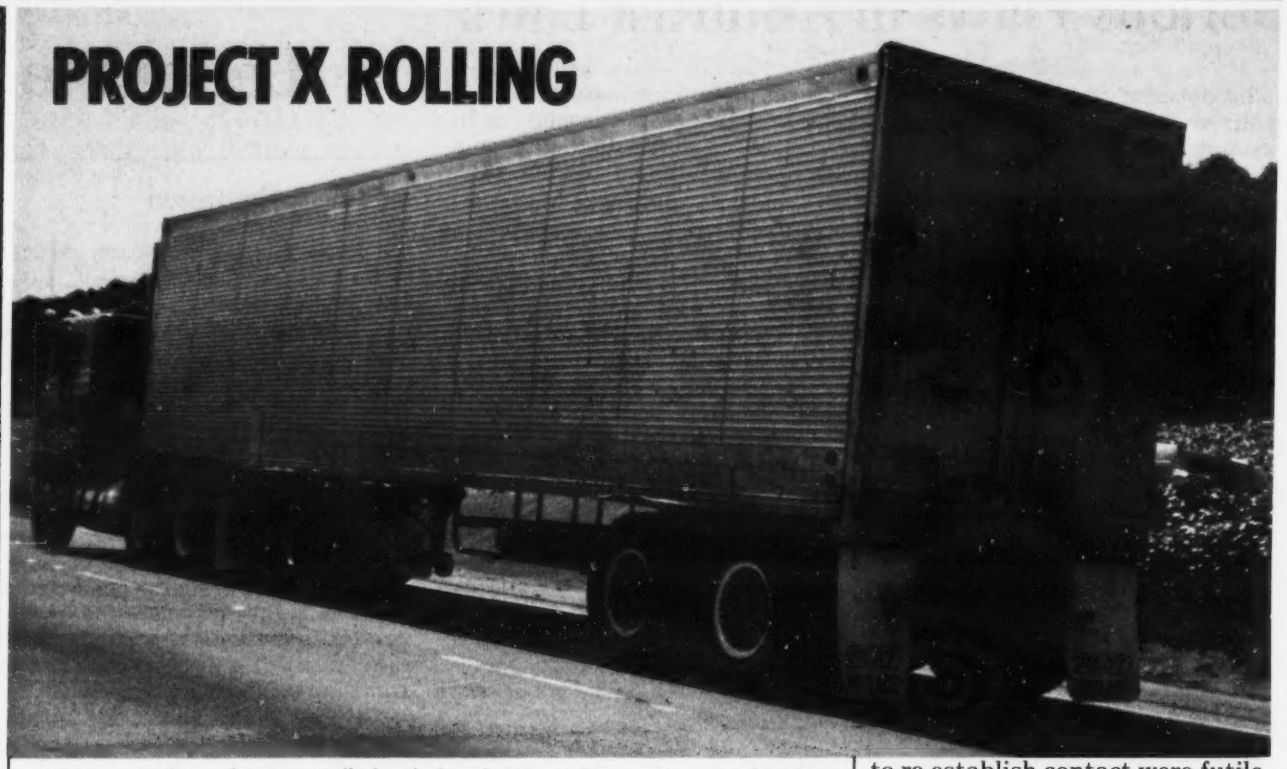
$895 Dumb Terminal— To Make a Terminal Less Expensive, You'd Have to Make it Cheaper *Page 21*

★ ★ ★

Project X in No Way Harmful to Human Life *Page 9*

★ ★ ★

Ballistic Printer— Must See to Believe *Page 20*



Mysterious LSI truck, reportedly loaded with Project X secrets, seen heading toward NCC. Truck is unmarked to confuse pursuers. INFORMER PHOTO

The INFORMER learned late yesterday, through a source located deep within Lear Siegler, Inc. HQ, that a shipment could already be on its way to the National Computer Conference (NCC). The shipment almost assuredly contains some of the wonder devices that LSI's Project X has been working on so strenuously and secretly.

The rumors that Project X was initiated to completely dominate the NCC through the deployment of astonishing new computer industry devices appears grounded in truth. New, smart terminals, a highly intelligent terminal controller, mind-fogging new printers, and even a complete data system seem destined to be revealed, INFORMER sources indicate.

Our informant at LSI HQ, severely hampered by doubled and tripled security measures in and around the hush-hush Project X, was able to leak few details, but they provided us with our first "hard facts." We were told of two new terminals being developed within the Project, each one capable of truly amazing exploits. Dubbed the ADM 31 and ADM 42 respectively, these incredible new devices are to be low-cost, smart editing terminals with microprocessor-based logic. Even as we sat listening, stunned, to this information over the telephone, our contact indicated he might be cut off at any time. Seconds after that, the transmission was, indeed, mysteriously terminated. Attempts to re-establish contact were futile.

Our informant's last audible phrases revealed a few titillating facts about the new terminals, however. It seems that the 31 will have two full pages of memory and function keys. What intricate functions these keys will actuate is something even the INFORMER will not know until further information becomes available. The 42, we also learned, is to have extended pages of data and additional RAM for its function keys. Even though the hard facts on these two new terminals were few, the implications are staggering, and it seems certain that LSI's dominance of the NCC is assured.

What other astounding revelations does Lear Siegler have planned for the NCC? What are the rest of the 31's and 42's awesome capabilities? Are the innuendoes that LSI is leaving the rest of the computer industry in

(Please turn to page 17, column 2)

Editorial

Loosening Old Ties

Users who loosely couple Amdahl Corp. and IBM CPUs are reinforcing the Amdahl assertion that IBM software is fully compatible with the non-IBM mainframes.

Not that proof was needed, but these coupled configurations give graphic proof that both types of CPUs can run the same utility software [CW, April 24]. Amdahl has admitted that a few changes had to be made in the error recovery code within the ASP utility, but this difference is essentially transparent to the user.

The commonality between these two vendors brings into focus the translators, conversion routines and other migration tools provided by many other vendors to wean a user away from IBM software.

There is no way to measure how many users have rejected non-IBM CPUs because of the significant software upheavals associated with their acquisition. The Amdahl/IBM compatibility has eliminated such headaches for these users.

The industry has lived for a long time with locked-in environments created by vendors to perpetuate their products. In software and data communications, environments have often been contrived to give the user carefully defined but limited mobility.

In their heyday, the plug-compatible peripherals showed that commonality can be beneficial to both user and vendor. Perhaps it is time to transfer this concept, as Amdahl is doing, into other important areas.

Serious Flaws in Antitrust Laws

The decision by the U.S. Department of Justice not to ask for interim relief in its massive antitrust case against IBM is a good one, but it does point out the failures of the nation's antitrust laws.

The department decided against asking for relief because it felt such a request would delay the trial inordinately, not because it did not feel it has proved its case against IBM.

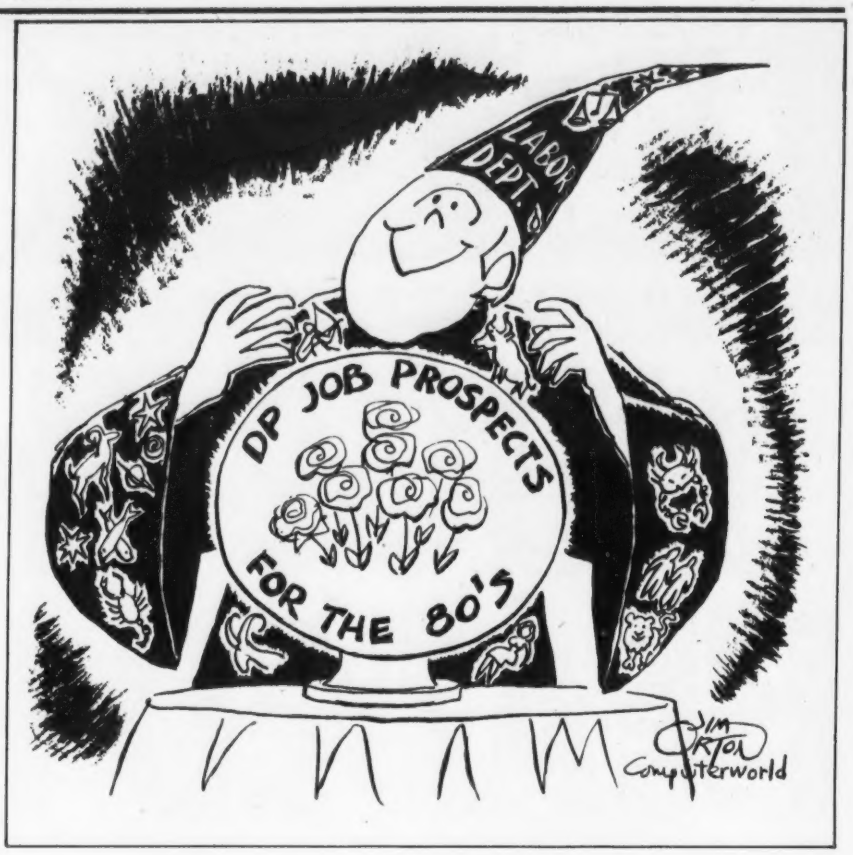
Clearly, there would have been a great deal of delay if the government had asked for such an order, and it is much better for it to pursue the whole case against IBM rather than waste time in stopgap measures.

But that decision shows once again how easy it is for a well-heeled corporation to delay the course of such a trial. The fact that IBM could have delayed the entire matter for up to a year if Justice had asked for interim relief shows there is something wrong with the antitrust laws.

It is in the interests of a corporation that monopolizes a market to delay any case brought against it as long as possible. After all, if the firm is truly a monopoly, it wants to keep earning those monopoly profits as long as it can.

The delays in U.S. vs. IBM — many caused by IBM maneuvering and some by government incompetence — have already taken up too much time.

If IBM really feels it is innocent of the charges, it should push for all possible speed in resolving the case and not try to slow the trial any further.



Letters to the Editor

Adding to Confusion

In the bantering in recent issues over the standardization of data base management systems (DBMS), there has been continued reference to the "Codasyl DBMS standard." For the record, the Conference on Data Systems Languages (Codasyl) does not make standards; it is responsible for developing technical concepts and presenting them to the public domain as published specifications.

The writing of standards and handling of the approval procedure in the U.S. is the responsibility of the American National Standards Institute (Ansi). It will be up to Ansi to consider the Codasyl documents on data base management for establishing a DBMS standard.

When speaking before professional and university groups in the U.S., Canada and Europe, I have found the question of DBMS standardization to be an area of general confusion, and bestowing upon Codasyl the ability to make standards only adds to this confusion.

Norbert John Kubilus
Fairfield, N.J.

Biting the Hand

As usual, Harry Newton's presentations are "entertaining" and not entirely informative and accurate [Communications Managers Urged to Fix 'Mess,' CW, April 10]. Invariably, attendees receive a potpourri of gibberish and motherhood statements, with the usual helping of truisms. Newton's kettle is now boiling over (and so are many communications managers) with his inflammatory statements about the "worst-managed disciplines in North American industry."

Newton should spend more time talking with the professional communicators in the business — which, incidentally, are in the majority — before he advises the telecommunications manager to make the voice manager "look like a fool." Why not take the opposite attack of establishing a strong rapport and working relationship for both groups?

They will eventually join forces to work together toward common goals — to improve service and bottom-line performance, while embarking on a program that is in concert with the corporate planning effort.

Clearly, the message for Newton is: Why bite the hand that feeds you?

Nathan L. Freedman
New York, N.Y.

Information for Handicapped?

I would like to obtain information about employment opportunity for handicapped people in the computer industry. Work experiences involving people afflicted with cerebral palsy would be particularly pertinent.

Any information received will be evaluated and passed along to interested high school students at the Massachusetts Hospital School here. Please address replies to me at 3 Margaret St., Canton, Mass. 02021.

Your cooperation will be greatly appreciated by the students at the school.

Peter C. Melvin
Canton, Mass.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
May 2, 1973

LONDON — In an attempt to improve both the image and practice of data processing, the British Computer Society published a computer code of good practice. At the same time, the U.S. proposed a "code of ethics" that its proposers, the Government Management Information Science Users' Group, said should be implemented for all state and local government data centers, particularly those handling sensitive police information.

— — —

TULSA, Okla. — Because computer users were turning to independent equipment at an ever-increasing rate in 1969 and 1970, IBM was forced to assemble a special, secret task force to try to determine how to stem the tide and keep users in the fold, a member of that task force testified here at the Telex Corp. vs. IBM antitrust trial.

Eight Years Ago
May 6, 1970

ATLANTIC CITY, N.J. — The 36th semiannual Spring Joint Computer Conference was expected to be bigger and better than ever, highlighting business-oriented minis. Attendance was expected to reach 40,000.

— — —

WASHINGTON, D.C. — A federal judge ruled that the Army could "collect, store and circulate" information on lawful political activities of civilian dissenters. Meanwhile, the Army announced the elimination of another computer-aided data bank and clarified its previous announcements on computerized data banks.

Humans, Not Machines, Make Judgments

By Jack Stone
Special to CW

One of the great success stories in the recent history of the retailing industry is that of Venture Stores, Inc., a division of May Department Stores headquartered in St. Louis. Venture, which consists of a regional chain of 27 stores, has expanded its revenue base from zero to more than $250 million in less than nine years.

For me, the mass consumer market has always evoked an image of total automation of the merchandising function.

However, when I had the opportunity to interview Robert Reznikoff, a divisional merchandise manager for Venture who is responsible for four of the corporation's major product lines, I found a decidedly human approach to the process of selling to the consumer marketplace.

Q. Bob, how do you define 'mass merchandising?'

A. I see this process as the tailoring of the assortment breadth and the inventory depth of products to the trends of consumer demands while maintaining consistently high values and fair prices.

Q. What has been your background and experience in the field?

A. I have a B.S. in economics from the Wharton School of Commerce and Finance of the University of Pennsylvania. I gained initial experience as a naval officer operating naval exchange activities. I helped manage a family-owned chain of clothing stores until I left to join Venture when it started.

Q. When did you first become a DP user? Did you have success?

A. I began when I was with the family business. We had a sophisticated system that used a dynamic inventory forecasting model as the basis for automated warehouse replenishment.

The system did a great job in increasing the in-stock position from about 60% to 90%, but the sales didn't get high enough to justify the system. In other words, we had a management problem; we improved our control over the store inventory, but the increase in profits didn't materialize. So we dropped it.

Q. I understand you were one of the key users of Venture's inventory management system when it was in early development. Has this system performed better than the one you just described?

A. It's doing a grand job. Oh, it's not perfect and getting changes implemented is always slower than we want, but the original design has held up well over the years.

Q. What are the primary capabilities of the current system?

A. The first is the ability to generate a weekly stock status report. This report provides sales and inventory information for all the staple items which have sales subject to forecasting over long periods of time. The report gives us, for each store and for all stores together, unit sales for the last week, the last 90 days and the results for the same periods last year. It gives us the sales figures for 90 days forward of this date last year, plus figures for units on order, including old, current and future orders. It lists total units on hand and on order. We also get monthly summaries for management analysis.

The Human Connection

Q. And the next major capability?

A. The system has an important facility that helps us plan for seasonal items. Merchandising managers may assign two-digit codes to the basic stock number of an item as a descriptor that has sales forecasting value.

In our line of dolls, for example, we have assigned codes — we call them "trend numbers" in our business — for each doll classification; soft body infant, new-born infant, drink and wet, toddler, talking, walking, TV dolls and fashion dolls. Then we can obtain sales histories studies on demand.

Q. Can you use these same reports to detect consumer fads? For instance, how do you know when to jump on such bizarre merchandising bandwagons as the "pet rock"?

A. Our system provides some help. We look for rapid sales, particularly on a week-to-week basis. But we also must use industry newspapers, field surveys and even my kids, who come home with some market intelligence.

This situation also says something about the computer machine and the merchandising manager: The machine can handle data and make decisions, but only the human can make judgments about events such as the fickleness of the consumer.

Contracts, Responsibility Need Clarification

The Taylor Report
By Alan Taylor CDP

It's a long way from Washington, D.C., to Kansas and even further from there to Honolulu. Yet in one day last month I had three communications that added up to a single story. Lee Lewellen, an experienced DPer from Honolulu, wrote about the fact that the damage DP professionals have caused in the past through error, neglect and faulty knowledge is now being challenged.

From Kansas, a different style of background in computers produced a letter from Dennis J. Molanphy. He has a master's degree in computer science and, as a law student, is interested in the question of how users and lawyers should interrelate. Basically, he argued that lawyers should be consulted before contracts are signed rather than after a problem is found. This is a very conventional view, but one that has some considerable difficulties in the real world of DPers like Lee Lewellen. Finally, from Washington came the news that the Federal Trade Commission (FTC) has become involved in the question of those H3 accounts used by Saks Fifth Avenue [CW, Dec. 26-Jan.2] and also in another question brought up by one of our readers: the correctness of entering as an immediate debit an order from a Sear Roebuck and Co. catalogue outlet, even though delivery has not been made.

The question of the H3 accounts has been brought out here more than once, but the Sears situation, the FTC told me, is related to the word "purchase" on the agreements. Does the purchase occur at the time the order is placed or does it occur when delivery is made, or at least offered?

There is no question that people do not like having to pay for undelivered items or orders they may have cancelled.

The writers from Hawaii and Washington represent two sides of an argument. The Kansas suggestion, from the middle, is undoubtedly where these two sides will eventually converge. Sometime, somehow, DP will get the type of contract a responsible lawyer can recommend signing.

Lawyers Reject Terms

I took a set of contracts with the various standard words not hidden in the fine print, but placed in the nice bold "limitations of liabilities" section and showed them to some lawyers. The I heard their horrified claims that they would never permit a client to sign such terms. These weren't lawyers specializing in DP who know how these contracts come to be signed, but they were good, solid practitioners with clients who have been signing contracts for computers, software and services for years, but have had no idea as to what the terms of those contracts were. I did this simply to confirm in my own mind that reader Molanphy's ideas are still not practiced by most users.

At the moment, it is such a seller's market for hardware and software that the things reader Lewellen is complaining about (errors, neglect, negligence and inadequate purposeful acts) are normally accepted as creating damage, but are exonerated and overlooked in our contractual items.

Yet there are signs of a changing attitude.

The FTC, in the matter of the H3 accounts, is moving as far as it can within the law to make firms refund millions of dollars to people whose credit balances have somehow vanished or become inaccessible. The agency is basing its actions in this matter on the principle that a computer program, unlike the actions of an isolated clerk in some department, must reflect the absolute policy of a firm.

And more and more people are understanding that sometimes damages to outside parties or to a firm are not the result of negligence within an installation, but instead are the result of errors and negligence by the supplier, who is currently protected by the wording in many contracts.

However, close scrutiny of a number of contacts is producing a lot of understanding as to the weakness of the contractual terms and the power of the common law concepts of fraud, innocent misrepresentation and product liability.

In particular, people are finding that while there are many protections built into the contracts, there are also many attacks. Also, while there are many measures the supplier can take to reduce or eliminate his liability, there are so few challenges to the procedures that they are often neglected.

It seems to me the trend at the moment is to pull these facts out from under the rug and admit even within a corporation that the current practice of putting millions of dollars at risk and exonerating suppliers from negligence is basically an unstable one.

At the moment the writers and the challengers of the contracts are working on a semantic level to discover what a person may or may not be exonerated from. But the important point is that these actions, with their wins and losses, are bringing out an understanding of the basic corporate irresponsibility in the face of the current seller's market.

There is no question that the reason DP professionals' errors, neglect and faulty knowledge have been overlooked by corporations in the past is that the DPers, if challenged, could have effectively pointed to the fact that their training came from the very suppliers the corporations had exonerated from responsibility. That would be too embarrassing to the corporation when it is trying to hold a system designer's nose in the dirt while having accepted such terms without a lawyer's approval (and even more embarrassing if a lawyer has given approval).

Little by little, the development of a less powerful supplier's market will give rise to an equal standard of responsibility for all DP experts and suppliers.

When this occurs, Molanphy's concept of having contracts that are received and approved ahead of time, the ideas from Washington as to the responsibility of users and Lewellen's ideas about responsibility for negligent work will coalesce into a responsible situation for everyone's benefit.

© Copyright 1978 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for noncommercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.

Abacus Works Well for Hex Calculations

Reader Commentary

By K.C. Toh
Special to CW

The letter from Guy B. Chase Jr. on using fingers for hexadecimal calculations [CW, Feb. 20] was interesting. However, everybody appears to have forgotten an obvious multidigit hex calculator that has been around for a very long time.

The Chinese abacus is a digital calculating device that represents digits of numbers by columns of beads. Each column has seven beads, two in the upper band and five in the lower band. Each bead in the lower band represents one and each bead in the upper band represents five.

In each band the beads may be moved up or down. The representation for zero is both upper band beads up and all five lower band beads down. A "1" is represented by moving one of the lower band beads up. Similarly, a "6" is represented by moving one of the lower band beads up and one of the upper band beads down.

When both upper band beads are down and all upper band beads are up, their representation is "15" or, for hex buffs, E.

Since each column can represent a hex number between 0 and E, the abacus is extremely easy to use as a hexadecimal calculator.

To add one hex number to the value already represented on the abacus, the operator merely moves a correct number of additional upper band beads down and/or lower band beads up. In the event that he is required to move more than five lower band beads up in total, he carries one upper band bead down and moves the five's compliment number of beads down.

This may sound complicated, so examples are in order.

Suppose the number "3" is already on the abacus and you would like to add three to it. Moving three beads from the lower band up is not possible because there are only two left. So the operator moves an upper band bead down and, at the same time, two lower band beads down.

If he wants to add "A" to this number, he has to move two upper band beads down, which again causes a "carry," but this time, to the next digit. After this, he would move one bead up from the next digit (which would be the equivalent of adding "E") and then move the upper band bead upward (which would have the effect of subtracting "5") and then move one of the lower band beads down (which would have the effect of subtracting "1.") The result is 10 (hex).

Of course, if one had to do so much mental arithmetic, the system would not be workable. However, the use of the abacus can become a conditioned process.

It goes without saying that any equipment that can be used to add can also be used to multiply by repeated adds. However, knowing the hexadecimal multiplication table will reduce the need for repetition at the same digit location.

K.C. Toh is regional marketing manager for the Computer Systems Division of the Borneo Co. in Kuala Lumpur, Malaysia.

10 Mbyte Disc Controller

Plug Compatible with Interdata® processors

Large Cost Savings. Direct from Stock.

XCOMP

7571 Convoy Ct. San Diego California 92111 (714) 560-4415

Hard copy made easy.

With the help of a high-speed microprocessor, Hewlett-Packard combines exceptional performance and convenience in a new low-cost printer and printing terminal.

The HP 2631A printer and HP 2635A printing terminal with alphanumeric keyboard are the first members of a new Hewlett-Packard family of hard copy terminals.

Each machine was designed to give you a number of high-performance features. And both can support a variety of interfaces, including RS232 and CCITT.V24, to fit into systems made by HP and other manufacturers.

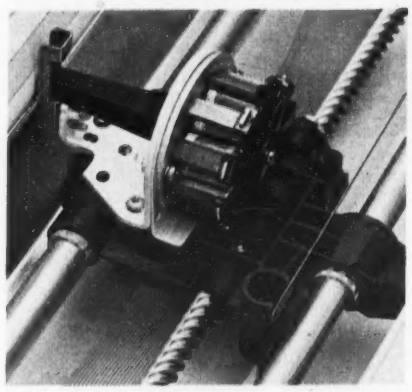
Bi-directional printing increases throughput. Both printers zip along at 180 cps in both directions, depending on your line layout. The microprocessor chooses the quickest path, and increases the speed even more by suppressing leading and trailing blanks.

High-speed slew for columnar data. When the microprocessor senses more than ten blanks in a row, it slews the print head at 45 inches per second to the next print position.

Three ways to print. The Character Compress/Expand Modes let you print more data on a page and emphasize points with headlines and titles. You can get as many as 132 characters on an 8-inch line, or 227 on a 14-inch line.

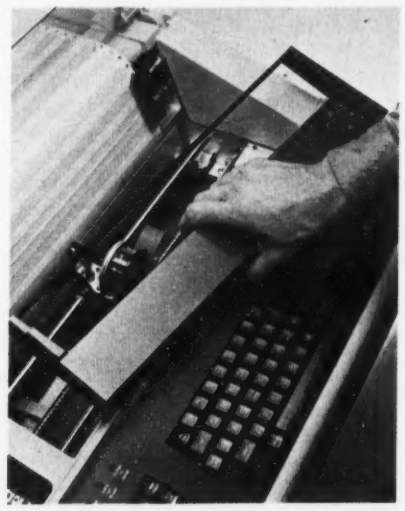
High-quality print, with six copy resolution. A 7 x 9 dot matrix (versus the usual 7 x 7) gives you clear, crisp printouts, right down to the sixth copy and meets the 128-character USASCII standard. And the extra two dot rows allow true underlining and descenders without character blurring.

Programmably interchangeable character sets. The HP 2631 can be made to print alternate character sets without reconfiguring the printer.



Long lasting, quick change print head saves service calls. The 9 wire print head is conservatively rated at a 100 million character life-span. It's also self-aligning. When you finally replace the head, you can do it yourself in a couple of minutes.

Long-life cartridge ribbon for a clean change. With a life span of at least 10 million characters, this innovative drop-in cartridge takes the mess and trouble out of ribbon changes.



Self-test for quick status checks. One key tells you if the printer is ready to go. If it isn't, the self-test feature helps you isolate the problem, reducing the time and cost for repairs.

Run everything under program control. All the features described and more can be programmably controlled. The software can take you in and out of the various modes. Or you can make a change yourself using one of the front panel switches or keys.

In a network or as part of a standalone system, HP now makes it simple to get the hard copy you need. If you'd like to see our printer or printing terminal in action, call the Hewlett-Packard sales office listed in the White Pages and ask for a computer systems representative. Or send us the coupon.

Yes, I'm interested in your new
☐ Printer ☐ Printing Terminal.
☐ Have your representative contact me.
☐ Send me more information.
☐ Send me OEM information.

Name Title

Company

Address

City/State/Zip

Phone

Mail to: Bill Murphy, Marketing Manager, P.O. Box 15, Dept. 308, 11311 Chinden Blvd., Boise, Idaho 83707

4670IHPB2

Be on the Lookout

DP Criminal at Large: End-Around Carrie

By Frederick T. Theobold Jr.
Special to CW

As you probably realize, it is necessary for all of us in the DP industry to be always on guard against those clever but unscrupulous people who practice computer crime. All data scientists who are honest folk must stick together and concertedly oppose those of us who are egregiously flagitious.

The security and well-being of every computer system in this country is currently imperiled by the machinations of one of these criminals. At large is one of the most cunning and ruthless data criminals since the inventor of the abacus.

You may have heard of this criminal by her real name, which is Caroline Enden. But more likely you know her by her favorite alias: End-Around Carrie.

It is not known exactly when End-Around Carrie initiated her life of crime, but she certainly began quite young. She graduated at the tender age of 18 and soon thereafter began practicing a form of prostitution.

She wrote RPG programs at a Honeywell installation in Shamoken. Her perversions were apalling. She coded statistical analysis routines in Snobol.

It is believed that Carrie has only once in her life held an honest job. She worked for a while at a hamburger joint in Cressen. During the period of her employment, the customers were wont to complain of the paucity of meat in the sandwiches.

One of the firm's auditors demanded that the manager conduct a parody check. The sharp-eyed manager soon discovered the cause of the problem: Add-Around Carrie was taking a byte of each customer's Big Macro.

The manager reported this to the owner, and it wasn't long before Carrie was DUMPed.

Whereabouts Unknown

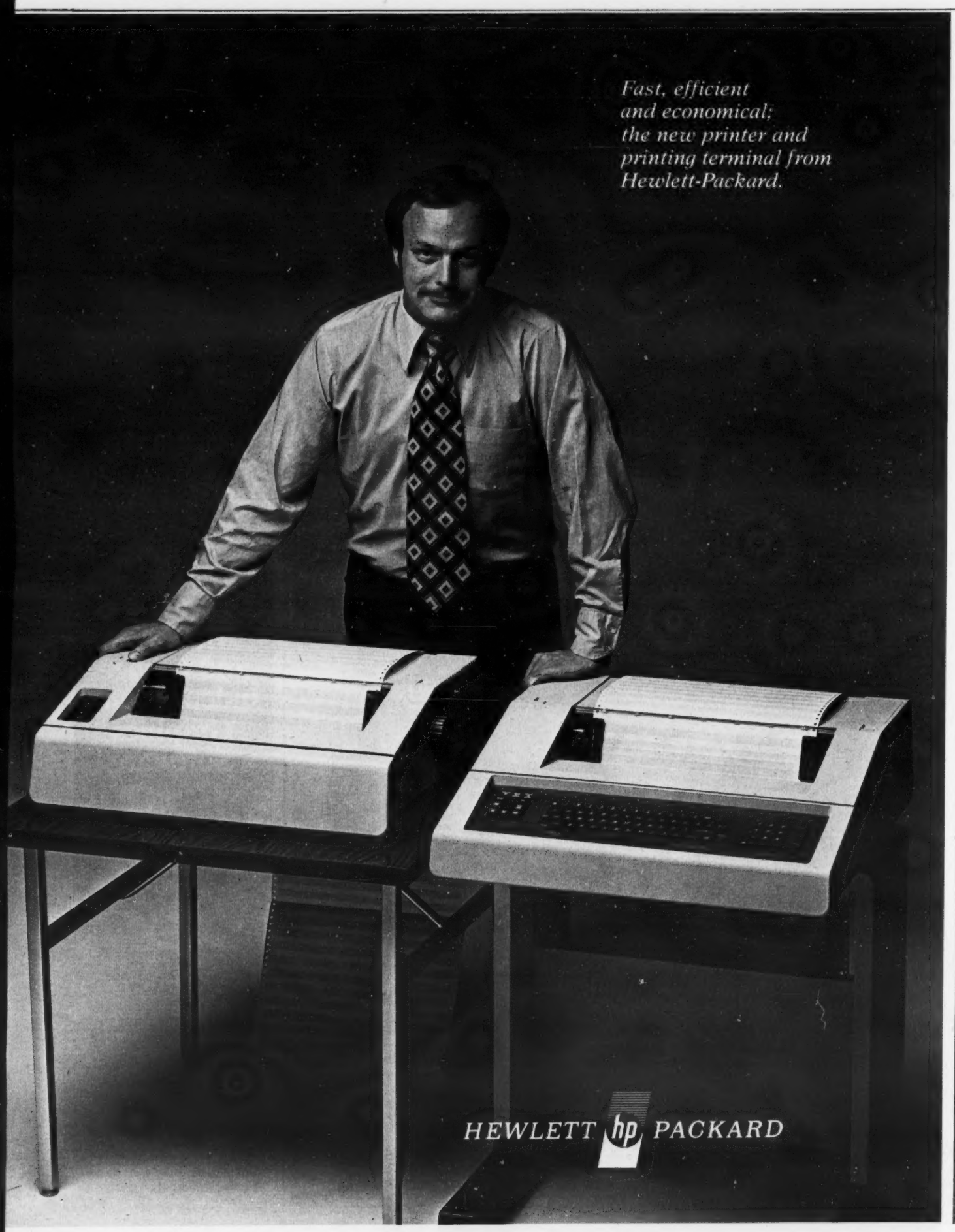
What happened to Carrie after she left Cressen, no one knows for sure. The authorities suspect her of all kinds of larceny, but so far they have no hard proof. She is wanted for questioning in connection with many different offenses, which at last count numbered ***FLOATING POINT OVERFLOW***.

When last heard of, Carrie was operating a swindle in which she sold outmoded and hopelessly obsolete software to DP managers at exorbitant prices. On a Monday in 1970, she approached a manager in New York, offering to sell him an Ansi-Cobol compiler.

The jerk paid five bucks for it. On Tuesday, the jerk discovered that the compiler was written in Zippy-Quik source language. Obviously, he needed a Zippy-Quick compiler before he could use his Ansi-Cobol compiler.

(Continued on Page 36)

Reader Commentary



Sealed proposals will be received by the City of Chicago until 11:00 A.M. CDST Monday, May 15th, 1978 for:

International Business Machines IBM 3155, Serial #10490 Frame 1 CPU-Central Processing Unit, Frame 2 PDU-Power Distribution Unit. Control Data Corporation CDC33155, Serial #0125 Two Meg Storage Memory System to be dismantled and removed by successful bidder. International Business Machines Model Feature S20470 One Dynamic Address Translation (D.A.T.) Box currently on order from IBM by City of Chicago, Delivery October. 15, 1978.

If interested, contact Anthony Luzzi, Chief Storekeeper (312) 927-5393 - 5422 for invitation to bid.

DPers: Look Out for End-Around Carrie

(Continued from Page 35)

His staff was unable to help him because they had never heard of Zippy-Quik. And he couldn't get this second compiler from Carrie because he was unable to reach her. Her phone was INOP, and her address did not fall on a full-word boundary.

On Wednesday, the jerk was approached by an elderly gentleman who offered to trade a Zippy-Quik compiler for the jerk's limousine. The jerk's relief was profound, and the deal was consummated.

The elderly gent turned out to be End-Around Carrie in disguise. The jerk turned out to be L.E. Donnegan Jr. The Zippy-Quik compiler turned out to be written in Ansi-Cobol source language.

Reader Commentary

By now you have probably guessed why I am personally so eager to put the finger on this rogue: I have been one her victims. Last year, I took over an installation where keypunching of transaction data had experienced serious schedule slippage. The system's master files were months in arrears, and I had to do something fast.

Carrie came to me in disguise, looking for work and bragging that she was the world's foremost expert in updating and posting. I hired her at once but, shortly after she started work, I caught her by surprise, without her disguise.

I recognized her immediately, hauled her up before a justice of the peace and charged her with cycle stealing. She then made good on her earlier rodomontade about posting. She posted bail with the SKIP bit set. That was the last I saw of her.

Reward Offered

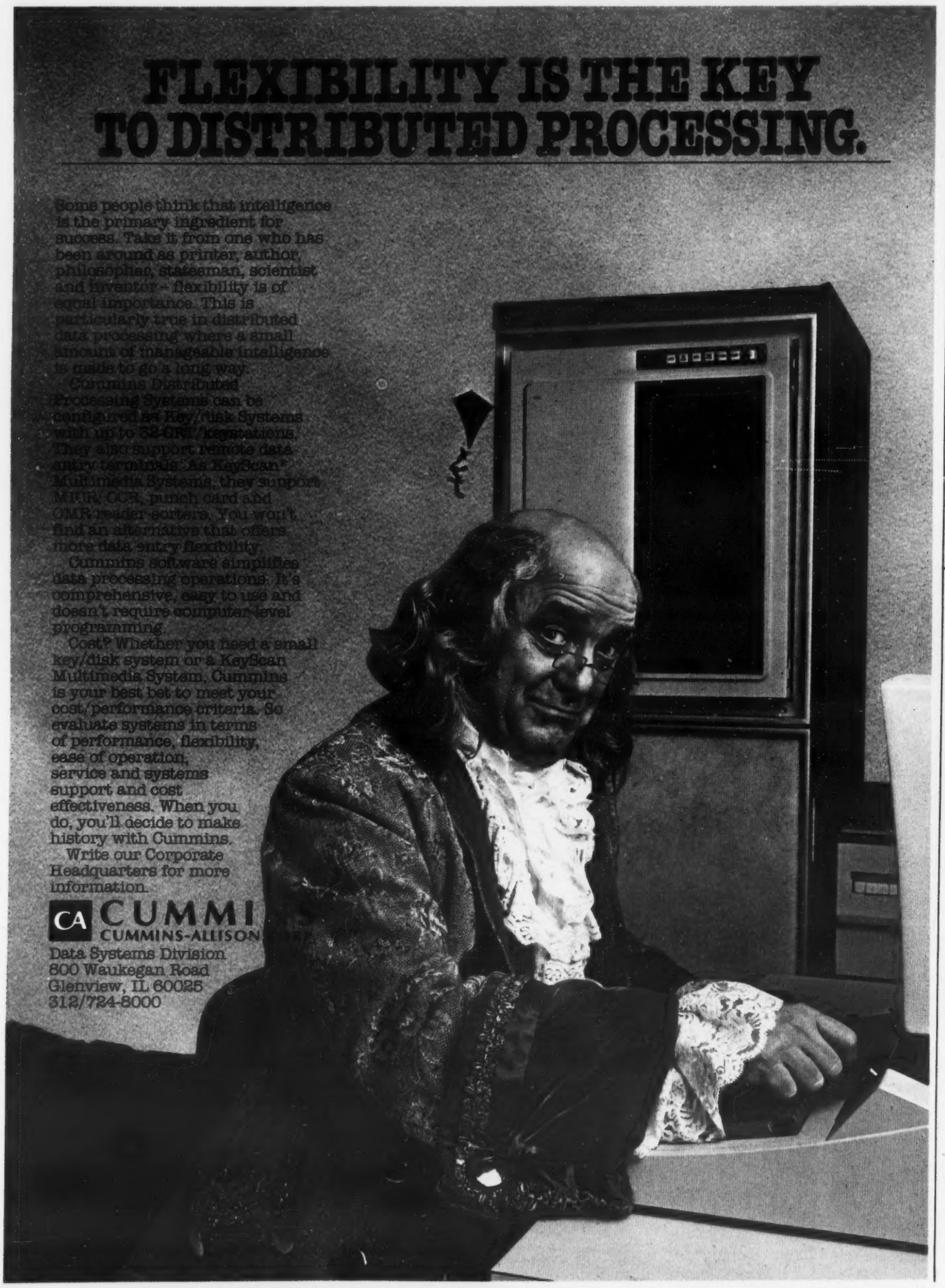
I'm sure you can see why Carrie's audacity and cunning make her one of the most feared criminals now at large. It will come as no surprise to you that the authorities would dearly love to REWIND CARRIE WITH LOCK and throw away the storage key.

If you spot Carrie, you must notify the authorities immediately. As a reward for information leading to her arrest and conviction, IBM is offering a 360/45.

Optionally, the claimant of the reward may specify a different computer system of similar power. Like the Altair 8080.

Any information you may have on End-Around Carrie, her activities, or her present whereabouts should be mailed without delay to DataSnoop, Inc., 256 Channel St., Floating Point, N.J. 65536.

Only you can prevent computer crime.



DISPLA®
Machine and Device Independent Graphics Software

For Information Call Or Write:
ISCO®
Integrated Software Systems Corporation
4186 Sorrento Valley Blvd., Suite G,
San Diego, CA 92121 (714) 453-0170

Package Makes the Difference

On-Line System Eases Dispersed Work

Special to CW

MUNICH — Policies issued by Allianz Insurance Co., the largest European insurance company, protect 5.6 million households in West Germany alone — 25% of the population. Allianz also serves thousands of customers in France, Spain, Italy, Brazil, Saudi Arabia and the U.S.

An insurance claim is filed, on the average, every 15 seconds, making an extensive and efficient DP system a necessity for prompt service.

Allianz maintains corporate DP headquarters here and DP production centers in Munich, Stuttgart, Frankfurt, Cologne and Hamburg. All centers are equipped with IBM 370/158s; the teleprocessing network is controlled by Tcam. More than 900 terminals are installed throughout the system.

All systems, programs and jobs are developed and tested at the main DP center here, where 150 people are employed in all phases of application programming, hardware planning and installation, documentation, operations and job preparation.

The entire library from each branch production center, plus new programs and jobs developed in Munich, are stored on a library disk. Once a week, the latest updates are dumped to tapes and sent to the branch production centers.

Direct Access Sought

Two years ago, new programs and updates to existing programs were being entered through a remote data center connected to the CPU by an IBM 2944 channel extension unit. More than 100 programmers used this facility, following conventional batch procedures for coding, card typing, card punching and job control preparation.

Since maintenance alone accounts for 50% to 60% of the programming effort, management realized it would be much more efficient if programmers could have direct access to the CPU through a terminal for program development, testing, updates and maintenance. Accordingly, Allianz set up a group composed of system programmers, instructors and application programmers to test leading time-sharing terminal systems. One of them was Roscoe from Applied Data Research, Inc.

"Because our CPU was already being utilized 80% to 100% by teleprocessing and batch jobs and because we could not expand our hardware, our greatest problem was the performance and CPU load of a terminal system for programming support. We found Roscoe best," according to Alex-

(Continued on Page 40)

'Diadem' Service Aids Forecasts Of National Economies, Markets

EL SEGUNDO, Calif. — The Diadem economic forecasting service for investment, financial and marketing strategists has been added to Computer Sciences Corp.'s (CSC) Infonet remote computing network.

The service models the economies of selected nations, allowing for transborder trade flows, and such major industrial markets as the automotive, energy and chemical sectors, CSC said. Diadem uses these models to generate both quarterly and annual forecasts.

At the national level, users can predict the effect of such changes as the introduction of new government policies, according to CSC. Diadem is also said to allow forecasting of demand, growth, prices and interest rates.

At the industry and market levels, Diadem users can predict production costs and the direction of their markets, evaluating the impact of new policies and conditions and deriving the relationship between their industry or markets and such economic factors as wage levels and material costs, the firm added.

At the company or product level, Diadem is said to allow forecasting of sales volume and the costs of raw materials, labor and financing. It also assists in the planning of production, inventory and purchasing requirements, CSC noted.

Diadem addresses the economies of the U.S., Belgium, Canada, France, Italy, Japan, the Netherlands, the UK and West Germany. The package was developed in London by Economic Models, Ltd. (EML), a firm CSC recently acquired.

Diadem is available at various levels of service. Full service costs $17,500 annually and includes EML's quarterly forecasts and interpretive reports, admission to relevant seminars and training services.

CSC is headquartered at 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

Text-Processing Standard?

WASHINGTON, D.C. — Sanctioned by the American National Standards Institute, the X3J6 technical committee on text-processing language held its first meeting recently in Arizona.

The committee's task is to develop a language, based on the American Standard Code for Information Interchange (Ascii) standard (X3.4-1977), to manipulate sequences of text strings, according to the committee chairman, Charles D. Card of Univac.

The proposed standard will encompass the description, recording, recall transformation, searching, manipulation and display of text. The committee hopes to have a complete draft by late 1980 and an approved standard by early 1982.

Interested members of the academic, user and producer communities are invited to join the effort. Contributions of technical papers before the next meeting — now scheduled for June 27-29 — will be welcomed, Card said.

Computer-based text processing overlaps with word processing and computer graphics. Word-processing equipment is expected to be interfaced to or use the proposed language. Interchange techniques with computer graphics are expected to emerge, although not within the scope of the standard, according to Card.

Human factors of the language will outweigh technical generality, he added. The standard will be described in terms that do not require a mathematical background beyond that expected of a typical American high school commercial course graduate, he claimed.

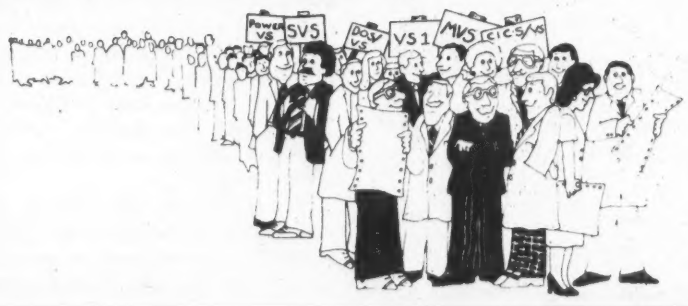
Technical contributions should be sent to the Standards Department of the Computer and Business Equipment Manufacturers Association, which will host the June meeting at 1828 L St., N.W., Washington, D.C. 20036.

Data Base Guide Keys on Business

PRINCETON, N.J. — "Data Base Design: The Service Analysis Approach," recently published by Performance Development Corp. (PDC), outlines a structured methodology for researching the business requirements a data base system must satisfy.

Costing $12 ($5/each for additional copies), the report can be ordered from PDC, Building M, 1101 State Road, Princeton, N.J. 08540.

You're in good company with the Johnson Job Accounting Report System used by more than 1,000 D.P. Managers.



SUPPORTS:
MVS—SVS—VS1—DOS/VS—POWER/VS—MVT—MFT—CICS/VS—IMS/VS—HASP
Tell us what areas you're interested in!

☐ Job Accounting ☐ Budget Control ☐ Resource Utilization
☐ Cost Distribution ☐ Thruput ☐ Programmer Efficiency
☐ Software Performance ☐ Customer Billing ☐ Job Scheduling

Send for your FREE 30 page System Characteristics Manual

Name_____
Title_____
Company_____
Address_____ City_____
State_____ Zip_____ Phone (____)_____
Computer_____ Operating System_____

C51

Johnson Systems, Inc.
8400 Westpark Drive
McLean, Virginia 22101
(703) 893-8700

Tape Management Improved With 'UCC One' Upgrade

DALLAS — Version 4 Level 4 of the UCC One tape management system software from University Computing Co. (UCC) is said to enhance the package's ability to protect data in IBM 360 and 370 environments.

Originally developed to improve the label checking of tapes provided by IBM, UCC One ensures that the correct input tapes are used and that valid tapes are not inadvertently used as output media, a spokeswoman explained.

The system builds a data base in order to track which tapes can be used as "scratch" tapes without depending on external paper labels on individual tape reels, she added.

The current release "greatly enhances the management control" portions of the system and also extends the reports the user can get from the data base, she said.

In addition to the generalized report writer which has been a part of UCC One from the beginning, Version 4 Level 4 allows users to create their own printouts to focus on situations not covered by the standard reports.

A flexible batch system is now available that allows updates of the data base from user sources normally outside the control of UCC One. Other significant facilities include Vsam catalog support and a correspondence routine that compares the tape management catalog with the OS/VS catalog, the spokeswoman noted.

An interface that allows tape verification and protection during OS Label Create/Destroy operations has also been added, and secondary file support has been extended. An expanded capability for certifying tape volumes and determining which need cleaning, is also available, she said.

The updated package costs $12,500 or $480/mo, but these figures are scheduled to increase in mid-May, UCC noted from 8303 Elmbrook, P.O. Box 47911, Dallas, Texas 75247.

Tektronix 4051 Users Get Development, Pert Support

SUNNYVALE, Calif. — A program development and debugging package and program evaluation and review technique (Pert) software have been introduced by Leland C. Sheppard for use with the Tektronix, Inc. 4051 graphics system.

The Documenter-II development and debugging package is said to provide formatted listings and cross-references of 4051 programs on any of several output devices.

The Event Scheduling System (ESS) is useful for any organization with projects to schedule and deadlines to meet, the firm said. As is standard with Pert methodology, ESS employs the critical path method to determine optimum scheduling of tasks.

ESS modules build and maintain a data base for a given project and generate charts and reports on any of several output devices.

Costs range from $300 for a single copy of Documenter-II to $1,500 for a large installation facilities license. ESS costs range from $900 for a single copy to $3,600. Included with both packages, are program source code and documentation on cassette, user instructions and the first year's maintenance.

Leland C. Sheppard is at Department W, P.O. Box 60051, Sunnyvale, Calif. 94086.

Multiplexer Gains RDOS Link

IRVINE, Calif. — Educational Data Systems, Inc. (EDS) has developed a Data General Corp. RDOS-compatible software driver for its Model 310 Mighty Mux multiplexer when it is linked to a DG Nova or Eclipse.

The package will support 128 RS-232C or current-loop ports operating independently at standard rates between 110- and 9,600 bit/sec under DG's standard or mapped RDOS, according to EDS.

With the software in place, users can "greatly enhance" I/O throughput by utilizing economical direct memory access synchronous and asynchronous serial line boards, expandable in eight-, 16- and 24-port increments to the maximum configuration, the vendor said.

EDS' software eliminates the "relatively heavy" RDOS character interrupt processing overhead, a spokesman claimed. This provides a "tremendous" increase in available processing power since the CPU is freed of all character-level I/O servicing, he added.

The RDOS driver is available free to all users of EDS' Model 310 Mighty Mux, he said from 1682 Langley Ave., Irvine, Calif. 92714.

Univac Updates 'QLP-1100' For Gains in Applications

ROSEVILLE, Minn. — The applications potential of Univac's Query Language Processor (QLP-1100) was "markedly increased" recently with the introduction of Release 3, which includes procedural capabilities and a macro facility, according to a spokesman.

QLP operates in conjunction with the mainframer's 1100 series Data Management System (DMS 1100) and is available as part of the OS/1100 software, he noted.

The procedural language facility enables programming-oriented end users to perform complex analyses, manipulations or updates against the data base. Utilizing the block structured approach, the added IF ... THEN ... ELSE and DO loop commands for instance, support procedure logic control, the spokesman added.

Data Manipulation

COMPUTER and PRESENT verbs are available to permit data manipulation and an OBTAIN command has been introduced to support relational retrieval of data within query procedures, he said.

The option to use conversational query language commands in procedural contexts is also provided, the spokesman pointed out.

The macro facility in Release 3 enables key users to define complex query sequences or procedures which can later be invoked by other end users in simple application-oriented terms. As a result, users have the means of expressing their data base operations in terms with which they are familiar, he said.

Simple English

The enhancements complement the conversational command language and report-writing capabilities provided in earlier releases of QLP 1100. Ad hoc data base inquiry and update requests can be expressed in the simple English of the conversational command language, the spokesman noted.

Nearly all data base reporting needs have been handled by the report writer modules, the spokesman said. On the other hand, the Release 3 features can handle data base applications not possible with the previous releases.

Now...here it is!

The second revolution in DP resource management:

OS/P™

OPERATING SYSTEMS FOR PEOPLE

The first operating system for CPUs started a revolution in the use and control of computer resources.

Today, 'people cost' is the major DP problem. To help solve it, Atlantic Software Inc. has created the "Second Revolution"— a new method to harness the productive capacity of DP personnel at every level. We call it OS/P — Operating Systems for People. It's the first integrated approach to total and effective project/resource management. An approach that lets you plan and build information systems in the most productive way, at costs and within time frames that can be realistically predicted and controlled.

OS/P is an integration of two Atlantic Software systems now in use at more than 500 data processing sites throughout the world:

SDM/70 — Systems Development Methodology
PC/70 — Project/Resource Management

Collectively, they provide the basis for managing all systems development resources. The proven way to transform "promises into results."

Find out how OS/P can be the key ingredient for success in your organization. Join the "Revolution."

Call or write today.

Atlantic Software Inc.
5th & Chestnut Streets, Philadelphia, PA 19106 (215) 922-7500

Regional Offices: Atlanta, Boston, Chicago, Dallas, Los Angeles, Philadelphia, San Francisco.
International Representatives in Major Cities World Wide.

Small Counties Gain Tax Help

DAYTON, Ohio — A property tax processing and billing package aimed at small municipalities or counties having less than 30,000 tax parcels has been introduced by NCR Corp.

The NCR 499 Billing System creates two master files — tax billing and tax rate — and analyzes the data stored in these files in order to generate bills, reports and notices.

The package was designed for use with an NCR 499 small DP system — comprised of a processor with 20K bytes of memory, three tape cassette units and a continuous forms handler — in contrast to the firm's recently announced more comprehensive Interactive Tax System that is based on its I-8200 and intended for towns and counties with up to 40,000 tax parcels [CW, April 17].

The NCR 499 Tax Billing System costs $600 and is said to be compatible with other government-oriented applications for the 499, including appropriations accounting, payroll, utility billing and general ledger systems.

It already looks like a success.

Not only does the new 1200 baud interactive DECwriter III hardcopy terminal look like the successful DECwriter II on the outside, it also looks a lot like it on the inside.

Because the DECwriter III uses many of the same components and subassemblies that have proved so reliable in our DECwriters, it's, in a very real sense, already a mature, field-tested product.

But what you'll get that's different is speed. 1200 baud, 180 cps speed. Along with 1K buffer capacity.

That means you receive data four times faster than conventional printers. And phone line charges can be reduced by as much as 75%. The 1200 baud speed of the DECwriter III also means you can combine the functions of a line printer and a CRT. Which saves you money and available office space without losing a bit of efficiency.

But the DECwriter III is more than fast and efficient, it's also very flexible.

For example, you can set operating modes—including four baud rates—at the touch of a finger. Plus, optional forms handling capabilities, including margins and tabs which can be set with typewriter-like ease. And because you probably handle different size forms, it can handle different size forms—up to six parts and 132 columns.

The DECwriter III.

A new 1200 baud interactive terminal with a very successful look about it.

For more info, call 800-225-9220. Or write, Components Group, Digital Equipment Corporation, One Iron Way, Marlborough, MA 01752. Canada: Digital Equipment of Canada, Ltd. Europe: 12 av. des Morgines, 1213 Petit-Lancy/Geneva, Switzerland. tel. (022) 93 33 11.

digital
COMPONENTS
GROUP

'Wylbur' Updated

SAN FRANCISCO — Version 4.0 of the Wylbur text-editing/on-line program development system now available from On-Line Business Systems, Inc. reportedly supports local and remote IBM 3270-compatible terminals.

The software also includes enhanced network control and line error-handling capabilities that allow an installation to update the network dynamically. A user exit facility also simplifies implementation of installation-unique requirements, according to a spokesman.

System console support allows the operator to communicate with and use Wylbur, while improved tab support includes logical tabs for terminals without hardware tabs. Version 4.0 costs $17,500 from 115 Sansome St., San Francisco, Calif. 94104.

Package Supports On-Line System

(Continued from Page 37)

ander Metz, chief system programmer. "It is a system with a small CPU load, simple language, a good data set organization and data security."

"During our SVS test evaluation period, we found Roscoe's overhead was less than 1% per terminal while the other system we evaluated required up to 4.5% per terminal," he recalled.

At Allianz headquarters, 110 users now have access to Roscoe through 45 terminals for systems and application programming, job preparation, information retrieval, term and project planning and monitoring, as well as documentation.

We have even convinced our life insurance subsidiary to use Roscoe, despite the fact that it was already using another terminal system — the same one we evaluated and rejected," Metz noted.

"With Roscoe, our programmers see the results of their efforts immediately," Metz said. "And they enjoy their work so much more that more work gets accomplished. After we installed Roscoe, we saw the number of jobs rise very quickly from 400 to 800 per day.

"We have prepared Rosprocs which prompt the user so a small change now requires only a very small effort. That means many more people can use the computer without special training or skills.

"Even without Rosprocs, Roscoe is simple to use because so much can be done through function keys on the terminal," Metz said.

"I don't believe there is any other system like Roscoe that can serve 45 terminals with such good response time. This has been very important to us because, if I give a terminal system to a user and he has to wait even 15 seconds, his mind wanders, he loses his train of thought and he doesn't work well.

"With Roscoe, the response time is so short delays are not noticeable," Metz explained.

Allianz has decided to install Roscoe at its five production centers. It will be used for faster job preparation and error correction.

"We also want to have Roscoe for our accounting system — to change, to insert, to correct. Up to now, we have had to insert changes manually; we want to do this with Roscoe," Metz said.

"We have no system to monitor everything our programmers do, but people, especially in our department, have said the programs we sent them were of better quality after installing Roscoe," he added.

The Outer Limits of Distributed Data Processing.

Portable terminals extend data's point of entry far beyond your perimeter of stationary workstations. Even in the most sophisticated distributed networks, source data is still being manually transcribed at the source and then physically carried to the operator of a key-entry installation. Using MSI's portable terminals, the data can be entered at the source by the people who are already working there.

Meeting the challenge of increasingly more complex data handling jobs and ever-larger data volumes, MSI's new family of portable terminals provide a broad range of functional capabilities:
4K to 48K words of CMOS segmentable memory, both key entry and optical wand scanning of various numerical bar codes, throwaway-batteries, asynchronous communications, and both LED and LCD displays. And because MSI's terminals are user-programmable, each terminal can be parameterized to suit its particular application and its working environment at the outermost reaches of source data entry.

For further information please write to William B. Patton, Vice President-Marketing.

MSI DATA CORPORATION

THE LEADER IN PORTABLE DATA TERMINALS

340 Fischer Avenue, Costa Mesa, CA 92627 (714) 549-6000

Atlanta (404) 691-7207 • Boston (617) 848-8450 • Charlotte (704) 525-2130 • Chicago (312) 392-8300 • Dallas (214) 270-6535 • Denver (303) 750-3333 • Detroit (313) 642-1970 • Honolulu (808) 955-1195
Houston (713) 664-4244 • Los Angeles (213) 692-0674; (714) 522-0914 • Memphis (901) 795-1230 • Milwaukee (414) 251-1774 • Minneapolis (612) 941-4836 • Greater New York (201) 567-3790 • Ohio (216) 486-1500 • Orlando (305) 834-5336
Philadelphia (609) 779-8940 • Pittsburgh (412) 941-8020 • St. Louis (314) 291-3080 • San Francisco (415) 944-0550 • Seattle (206) 575-3115 • Toronto (416) 638-0034 • Vancouver (604) 986-3911 • Washington D.C. (703) 560-5500

Caracas, Venezuela 781-8888 • Eindhoven, Netherlands 040-433584/TELEX 51168 • Johannesburg, South Africa 786-2280/TELEX 8-3362
London, United Kingdom 0628-33121/TELEX 851-847-889 • Melbourne, Australia (03) 211-1022/TELEX AA31604 • Milan, Italy 02-879246 • Karlsruhe, West Germany (49-721) 386735
Oslo, Norway 01/204030/TELEX 19419 • Paris, France 686-5412/TELEX 84-242-01 • Tokyo, Japan 03 (543) 7611/TELEX (L.A.) 67-4436

'I Think Fred's Been Debugging Long Enough.'

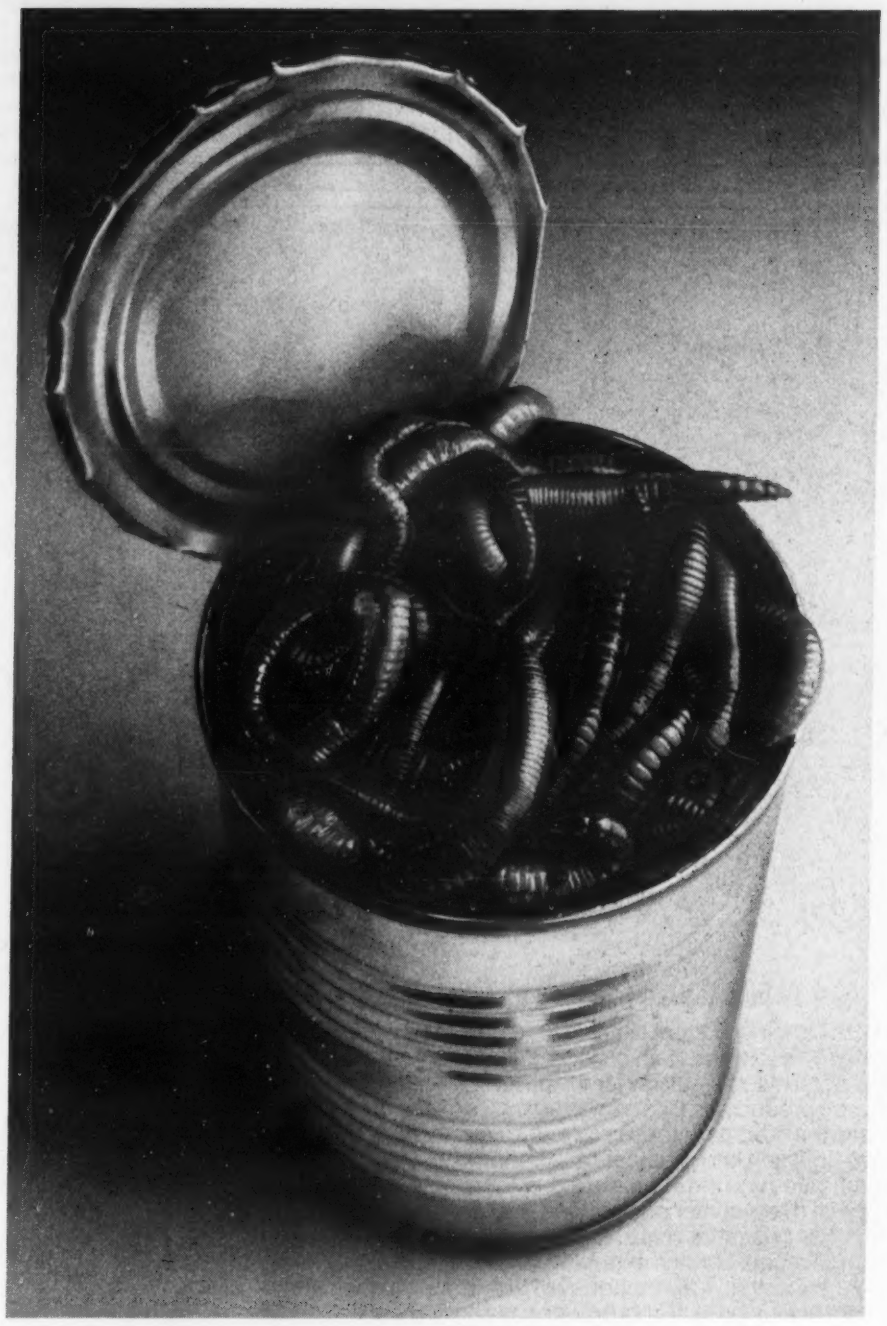
3830-2
Control Units
AVAILABLE
WITH
MADRIDS
COMDISCO
312-698-3000

WHY NO ONE WANTS TO TALK ABOUT SOFTWARE COSTS FOR DISTRIBUTED DATA PROCESSING.

Most people would like to keep the lid on. Because software maintenance costs can take as much as 40% out of a computing budget. But Data General is not only willing but eager to talk about software costs. Because we have the CS/40 computer system for business.

The CS/40 has a unique combination of features that cut the cost of maintaining and enhancing application software by 30%. Things like screen formatting and data file management. And multiterminal interactive COBOL, the most familiar language for business systems.

So ask a CS/40 Business Computer System Supplier about software costs and he'll talk about them openly. Call (617) 366-8911, Ext. 4375. Or write for our brochure.



Data General

We make computers that make sense.

Data General Corporation, Westboro, MA 01581, (617) 366-8911. Data General (Canada) Ltd., Ontario. Data General Europe, 61 rue de Courcelles, Paris, France, 766.51.78. Data General Australia, (03) 89-0633. Data General Ltda., Sao Paulo, Brazil, 543-0138. Data General Middle East, Athens, Greece, 952-0557. © Data General Corporation, 1978.

Manufacturers Aided

COSTA MESA, Calif.— Designed to run on Data General Corp. Nova 3 minicomputers, Production Master from Applied Business Systems (ABS) is said to allow a manufacturer to maintain cost and material control of component items and finished goods whether they are standard, "semi-custom" or custom products.

Production Master is particularly suited to small- and medium-scale firms manufacturing "large ticket" items. It starts with order entry, during which operators at CRTs can interactively modify the standard bill of materials for a product in order to customize it to the customer's requirements.

After that, the system takes over to produce all the documentation needed to get the order into and through production and released to the customer, with appropriate reports to the manufacturer's management to keep the system running smoothly, the spokesman said.

The minimal configuration needed to support Production Master is a 64K-byte Nova 3 with 10M bytes of disk storage, one CRT and one printer running single- and multiuser Extended Basic under mapped or unmapped RDOS.

The single-user license fee is $5,500 or $525/year. OEM and dealer one-time licenses for multiple CPU use are also available, ABS said from Suite B-6, 3303 Harbor Blvd., Costa Mesa, Calif. 92626.

DOS/VS Job Streams Built By Enhanced 'Flee-Flim'

COLUMBUS, Ohio — An enhanced release of a replacement system for IBM's DOS/VS linkage editor and library maintenance functions, Flee/-Flim Version 5 from Goal Systems Corp. is said to be more flexible and more efficient than earlier releases.

An added major component called GSERV is primarily a jobstream generator that allows 20-level nesting of procedures, unlimited JCL substitution and spooler independence; it can be used as a powerful procedure library facility, a spokesman claimed.

The entire set of Flim source statement library update commands can be used to make temporary changes to a GSERV procedure or permanent changes to the DOS/VS procedure library, he said, in addition to its normal updating of the source statement library.

The library member rename feature has been extended to allow whole families of modules to be renamed and the names restructured, the spokesman added.

The linkage editor replacement (Flee) has been enhanced to produce a more meaningful linkage-edit map, he said, noting that all addresses are now shown in both absolute and partition-relative values.

The multiple CPU optional feature of the package, which allows sharing of system-resident and private libraries between real or virtual machines, has been extended to allow any mixture of shared or nonshared libraries.

The package is available for $65/mo or $702 on an annual lease. Goal can be reached through P.O. 29481, Columbus, Ohio 43229.

Reports Added To 'DOS Jars'

McLEAN, Va. — Johnson Systems, Inc. has extended the standard reports provided with its DOS Job Accounting Report System (DOS Jars) so users now have 36 instead of 27 formats that can be generated by name, a spokesman noted.

The "working set" of reports are grouped by functions ranging from financial management to resource planning and including performance evaluation, throughput analysis, configuration analysis and program/programmer monitoring, he said.

Running under either DOS or DOS/VS, DOS Jars cost $4,000 or $240/mo. A lease/purchase plan is also available, the company noted from 8400 Westpark Drive, McLean, Va. 22101.

O-W-L. On-Line Without Limits. This extraordinary system gives your people total freedom of text manipulation and editing. It means unlimited creativity for the programmer. And the increased productivity that comes with it. The Moving Window breaks the 80-character barrier and allows the display to move right and left for easier comprehension. The Toggle Switch gives you the choice of either full or split-screen display with direct cursor editing. On-Line Dynamic Recall summons prior revisions at a single command and highlights the most recent change in display. Editing occurs right before your eyes. It all happens with the fastest response time in the business, without monopolizing computer resources. Security (people access as well as data access) is enhanced by a unique four-level variable password system. Simplicity of design makes this the only system on the market that's user-installable. Low prices and free trial (15 days) makes users out of triers. NCI is years ahead. You can be, too. Just send us the coupon.

INTRODUCING O-W-L THE ON-LINE PROGRAM DEVELOPMENT SYSTEM THAT'S A CUT ABOVE EVERYTHING ELSE BECAUSE IT GIVES YOU FULL-SCREEN TEXT EDITING. AND A WHOLE LOT MORE.

0-3

Name_____

Company_____

Address_____

City_____ State_____ Zip_____

Telephone: _____

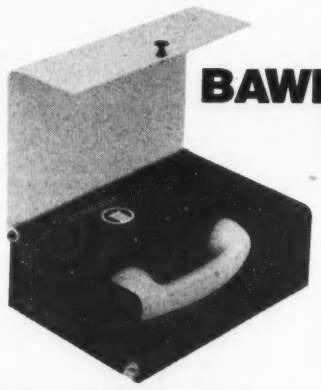
Our Computer is: _____

NCI, Inc.
6075 Roswell Rd., Atlanta, Ga. 30328, (404) 252-9474

NCI, Inc.
OUR COMPETITORS JUST CAN'T COMPETE

REPRESENTATIVES IN MOST COUNTRIES THROUGHOUT THE WORLD

BAWDY 12



The Double-Duty Modem!

Omnitec Data's 1200B gives you the portability of an acoustic coupler and a fixed-installation data access modem in one compact package — all with the ability to transmit or receive at **1200 bps** on a standard dial-up network — acoustically or with DAA. It's Bell 202C, S, DAA-CDT-1000A compatible, too, including EIA RS232C interface.

Check into the Bawdy 12 — Write Dept. 424 or call (602) 252-2083 collect.

OMNI-TEX

OMNITEC DATA
"New Dimensions in Modems"
2405 South 24th Street • Phoenix, Arizona 85034

Through Intelligent Nodes

Packet Nets Give Terminal Independence

By Jeff Winters
Special to CW

One of the main advantages of a packet network that provides terminal-to-computer and computer-to-terminal communications is terminal independence. The network must support all types of low- to medium-speed terminals. The same criterion holds for the other end of the circuit: The network should be able to talk to any type of computer (host). In effect, the user should be able to use any kind of terminal to communicate with any kind of host.

Tymnet provides terminal independence through the locally accessed intelligent nodes, where a minicomputer handles the terminal characteristics. The network consists of nearly 300 mincomputer nodes that are interconnected by leased synchronous communications lines ranging in speed from 2,400- to 9,600 bit/sec.

The minicomputer nodes fall into two categories: remote and bases (Tymcoms). Broadly speaking, the bases act as the interface between the hosts and the network, while the remotes double as the interface between the terminals and the network and as nodes in the network.

A user calling a remote types a character to identify the kind of terminal he is using. Most major terminals are supported.

The remote analyzes this character to determine the transmission rate, character set, carriage return delay time and other parameters. It then assigns two software routines to the line (port) on which the user is coming in: one for input and one for output (some terminals use a slower character rate for the keyboard than the printer). These routines handle all idiosyncrasies of the terminal, including conversion to and from Ascii if the terminal is non-Ascii. In this way, the network can easily accommodate new terminal types as they become available.

With the remote handling the direct communication with the terminal, the network is free to do what it does best: transmit data. After receiving the terminal identifier, the remote asks the user to log in, and the user enters a user name and password. The remote passes this information on to the network supervisor, which is a special node that monitors network topology, failures and load conditions and that establishes optimal paths for circuits.

The supervisor validates the user name and password against a master user directory and then determines which host should be acessed.

When this is accomplished, the supervisor recedes to the background and host-user interaction begins. When the user leaves the network, the supervisor is informed and it can then reassign the freed-up facilities.

Character's Route

The way this actually works is illustrated by tracing a data character's route through the network. For example, suppose the user's path is from the remote (Node A) to Node B and from Node B to the base (Tymcom) interfacing the host computer.

When the user strikes a terminal key, the terminal serializes the character and feeds it into an acoustic coupler. The coupler sends it over a telephone line to an asynchronous modem on the remote. The remote then reassembles the character and places it into the outgoing buffer assigned to the user and then assembles a packet (record) to be sent to Node B.

This packet contains a header, data from one or more buffers and two different checksums of the packet. Any packet can contain data for several different users traveling from Node A to Node B.

This packet is then sent out on a synchronous line to Node B. Node B checksums the packet and sends an acknowledgment, if the data is correct, back to the remote. If there is any discrepancy, the packet is retransmitted. Node B disassembles the packet and distributes the incoming data, placing each user's characters in the appropriate outgoing buffer. Node B then assembles a packet to go to the base.

The base disassembles the packet and distributes the data, putting user's characters into the appropriate ports going into the host. Data coming from the host to the terminal follows the same procedure in the opposite direction.

The network and the hosts on the network need not be aware of the idiosyncrasies of the terminal, because the remote handles the translation of speed, full- or half-duplex characteristics, character set and delay times of the terminal.

Jeff Winters is a product support specialist with Tymnet, Inc., 10261 Bubb Road, Cupertino, Calif.

Phone Pricing Has Cost U.S. $32 Billion Since '70: CCMI

By Ronald A. Frank
CW Staff

RAMSEY, N.J. — A telecommunications research firm here has charged that current telephone pricing policies have cost the U.S. economy almost $32 billion in increased costs of goods and services since 1970.

The analysis of telephone pricing was done by the Center for Communications Management, Inc. (CCMI) to examine the relationship between business and residential rates for telephone service.

Business has traditionally paid more for telecommunications services because of the "value of service" concept based on the hypothesis that business can more readily absorb rate increases than the individual subscriber because of tax considerations.

But instead of absorbing the increased rates for voice and data facilities, business is passing along the increases to its customers in the form of higher prices for goods and services, the CCMI study concluded.

Since 1970, regulatory agencies and the phone companies have "tacitly agreed" that business should bear the primary burden of rate increases. This strategy has been moderately successful for the phone companies, the study pointed out, because the residential consumer "perceives that he has been protected from higher telephone bills."

Under the existing rate structure, each $1 of rate increase applied to the "nonconsumer segment" eventually pushes up consumer prices by almost $2.24, the study claimed. If telecommunications rate increases has been spread evenly between business and residential users, the economy would have been spared a $32 billion increase since 1970, the study said.

The findings are part of a two-volume, 475-page report called *An Economic Impact Analysis of Telecommunications From 1970-1978*. It is available for $3,500 from the Center for Communications Management, Inc., Box 324, Ramsey, N.J. 07446.

CLIP AND RETURN FOR FAST RESPONSE

ComData

☐ Series 200 frequency division multiplexer

Data rates: Mixture of asynchronous channels up to 300 baud
Channels: Maximum of 18 channels
Diagnostics: Remote and local loopback, test, busy-out, indicators
Multi-drop: Drop one or more channels at a number of locations
Multiple access: Multi-drop channels have equal opportunity for processor channel
Line: Dial or dedicated
Options: Voice-plus-data, data regeneration

$465 basic unit
$325 channel end

codex

☐ Series 900 time division multiplexer

Data rates: Mixture of synchronous or asynchronous up to the high speed modem aggregate
Channels: Up to 64 channels
Diagnostics: Remote and local loopback, busy-out
Line conditioning: C2 conditioning recommended
Options: Auto speed detection, multi-drop

$1283 base unit
$152 async channel end

☐ Acoustic Couplers ☐ Modems ☐ Terminals ☐ Accessories
Check items of interest and return to us for additional information

ComData
8115 Monticello
Skokie, IL 60076
312/677-3900

member of IDCMA

New York
212/267-3696

Los Angeles
213/624-0550

name _____
company _____
street _____
city _____ state _____ zip _____
telephone _____ ext. _____

~multiplexers

For Cyber 170, 70, 6000 Series

CDC Beefs Up Support on Net OS Software

MINNEAPOLIS — Control Data Corp. has announced enhanced software features for the company's Network Operating System (NOS) and Network System/Batch Environment (NOS/BE) that support the CDC Cyber 170 series of large-scale systems as well as older Cyber 70 and 6000 series systems.

Communications capabilities of both operating systems have been expanded with the release of Intercom 5 for NOS/BE and Network Products for NOS. These now support a range of asynchronous, teletypewriter-compatible terminals at line speeds up to 9,600 bits/sec and Mode 4 protocol at 19.2 kbit/sec, CDC said.

Both operating systems also support Hasp multileaving workstations at line speeds up to 19.2 kbit/sec. The NOS Network Products are also said to support a variety of processing modes, including an interactive facility, remote batch and transaction processing and user-written terminal applications that can be tested using a software stimulator.

The data security and privacy features of NOS have been expanded, the company said, and, through the addition of a private file type, controlled access to user passwords and full user validation of diagnostic software.

CDC said that a number of hardware features also have been added to NOS including support of CDC 677 and 679 magnetic tape subsystems with 6,250 bit/in. high-density data recording; and support for the full-tracking capability of CDC 844 disk subsystems that can provide Cyber 170 users with improvements in data throughput performance of 5% to 30%.

Software products available under NOS and NOS/BE are PL/I, a Fortran interactive debug package, a terminal independent graphics subsystem and a concurrent data manager. A new text editor is also available under NOS, the firm noted.

These features of the NOS and NOS/BE operating systems are now available to new Cyber 170 system customers with deliveries beginning in June and to existing system customers at that time, according to the firm.

The CDC software products are available for an initial payment plus a monthly fee or for a one-time charge. The Network Products option costs $120 plus $690/mo or $27,600; Intercom 5 is priced at $120 plus $680/mo or $27,320; and the data manager costs $530 plus $630/mo or $25,730. Other software is priced similarly with complete information available from local CDC branches.

POS System for Small Retailers Links DEC Mini, NCR Terminal

COLUMBUS, Ohio — Point of Sale Business Systems, Inc. has developed a retail management system for the smaller retailer that interfaces the Digital Equipment Corp. PDP-11/03 minicomputer with the NCR Corp. Model 250 point-of-sale (POS) terminal for processing as well as automated data entry.

The PDP-11/03 has 32K words of memory, and the system includes two DEC RL01 disk drives with 5M bytes each of memory, one DEC VT52 CRT and one DEC LA180 line printer, a company spokesman said.

Sales transactions can be entered manually into the NCR 250 or automatically via an optional optical character recognition (OCR) reader. The system outputs information to create the OCR tickets, according to the firm. The system reportedly provides inventory control, sales analysis and a complete billing system.

Main program options are said to include sales analysis, on-hand and dollar value report, on-order report, minimum stocking level report, salesperson productivity report, type-of-sale report, customer billing statement and general ledger interface.

Other software packages available, the firm said, include general accounting applications and custom applications such as a gasoline and fuel oil billing system, a tennis club billing system and construction payroll.

Base price for one application system, including hardware, is $40,000. Point of Sale Business Systems, Inc. can be reached through P.O. Box 20064, Columbus, Ohio 43220.

Periphonics Cuts T-Comm 7 Prices

NEW YORK — Periphonics Corp. has cut prices of the T-Comm 7 front-end processing and audio response system by 33%, the firm announced.

The pricing concept includes a six-month warranty which, in effect, affords new T-Comm 7 users the benefit of six months maintenance at no charge on any system ordered after April 10, Periphonics said.

The cost reduction "across the board" on all T-Comm products lowers the average price of a T-Comm 7 system to $95,000 — down from the original $140,000 figure. T-Comm 7s will now range from $60,000 for a basic system to approximately $147,000 for the most sophisticated model.

Periphonics Corp. is at 75 Orville Drive, Bohemia, N.Y. 11716.

CICS USERS

DASD's new utility map generator (MAPGEN) will increase your BMS coding productivity by at least 75%.

MAPGEN is not a new language. It is a system where the completion of a simple specification form will greatly improve accuracy by eliminating unnecessary data, add flexibility and greatly simplify maintenance. All DFHMSD, DFHMDI and DFHMDF macro source statements are program generated.

A hard copy image of each screen is automatically printed at the time the map is defined.

'Map build' features aid in the use of extended features under CICS/VS.

Call or write today

DASD CORPORATION
National Marketing
1480 Renaissance Drive — Suite 315
Park Ridge, Illinois 60068
312/299-5005

DASD CORPORATION

Upgrade to IBM 6250 BPI tape drives now!

SAVE IBM RENT — ELIMINATE DOWN-TIME caused by field conversion

We will purchase your IBM 800 1600 BPI drives now & install 3420-4 3420-6 drives immediately from inventory.

Call Nick DiBari
312-698-3000
or your nearest Comdisco office

COMDISCO

HONEYWELL OEMS!
THE COMPLETE DATA BASE/APPLICATION PACKAGE FOR SERIES 60 LEVEL 6 MINICOMPUTERS
"INFO6"

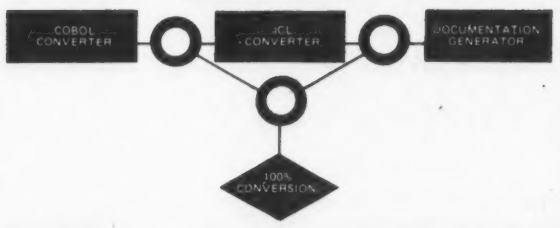
- DATA ENTRY
- DATA UPDATE
- QUERY ON ALL FIELDS
- MULTI-TERMINAL
- REPORT GENERATION
- CALCULATIONS
- PRODUCTION PROCESSING
- SORTS
- PRINT SPECIAL FORMS (checks & taxes)
- INPUT SCREENS

COMPLETE APPLICATIONS

- Easy for non Data Processing person to write reports in minutes.
- Meets all Data Processing requirements for first time user.
- At $5000 this package out-performs Data Base Management Systems many times its cost.
- Handles any standard GCOS6 files.
- Data Processing Professionals can develop full applications or ad hoc reports in a fraction of the conventional programming time.
- Helps you win in head to head competition over DEC and Data General.

CALL OR WRITE
JIM WILLCOX
V.P. MARKETING
HENCO, INC.
20 WALNUT STREET
WELLESLEY, MASS. 02181
(617) 237-4156

FOCUS
DOS TO OS



$10 PER COBOL PROGRAM

I. FOCUS CONVERTS DOS COBOL SOURCE CODING TO OS
II. FOCUS CONVERTS DOS JCL TO OS JCL
III. FOCUS PRODUCES OPERATIONS DOCUMENTATION
IV. FOCUS supports UCC-II.

EXPERIENCED, PROVEN, TESTED AND IMPLEMENTED
FULL SUPPORT; ON SITE INSTALLATION AND BRIEFING SESSIONS
ELIMINATE – COST OVER-RUNS
ADDED EXPENSE OF MAINTAINING TWO OPERATING SYSTEMS
EXPENSIVE OUTSIDE SERVICES

FOCUS INTERNATIONAL LTD.

P.O.BOX 162 AUBURNDALE,MA. 02166
(617) 965-2090

The reason Epoch 4 has been so successful in Finland is because it deserved to.

Quality. It stands out all over the world.

Finland has one of the highest standards of living in the world. It's a country noted for engineering ingenuity and technological excellence.

A computer product that can make it big in Finland can make it anywhere in the world.

Finland today is one of Graham's best markets for Epoch 4 computer tape. Its record of performance, through billions of passes, has made believers out of data processing people all over the free world. And millions of reels of Epoch 4 are now in use.

Epoch 4 is the patented one. The one that's never been duplicated. Never equaled.

GRAHAM MAGNETICS *Proven around the world.*

Graham, Texas 76046

PIX-II Software Gives Remote Device Priority

LARGO, Fla. — Paradyne Corp. has announced a software enhancement to its PIX-II virtual data link that reportedly allows users to assign priority access parameters to remote devices in mixed interactive and remote job entry configurations.

The software allows the user to enter simple control words, via a remote console, that group interactive devices such as IBM 3270-type CRT terminals into a high-priority subset and to similarly group batch-type devices, such as printers, card readers and tape systems, into a lower priority subset, a spokesman explained.

All these devices are supported on a single physical link for reduced telecommunications line costs. Since all data communications functions, including the prioritizing capability, are handled by the PIX-II system itself, there is no teleprocessing software overhead on the mainframe, the spokesman noted.

PIX-II is a minicomputer-based data communications system that allows IBM 360 and 370 users to link multiple remote devices to a central host over a single communications line and to implement Synchronous Data Link Control protocol without teleprocessing software on the mainframe. The system consists of a Local Control Unit (LCU), which attaches to the byte multiplexer channel of the host, and Remote Control Units (RCU) at dispersed sites, which can support multiple IBM and/or Paradyne devices such as interactive CRT terminals, printers, card readers and tape drives.

The software enhancement will be released to PIX-II users in September. Its price will depend on the type and number of attachments.

LCU pricing begins at $475/mo on a five-year lease, which includes a 4,800 bit/sec modem and maintenance. RCU prices begin at $390/mo, also with a 4,800 bit/sec modem and maintenance.

Paradyne is at 8550 Ulmerton Road, Largo, Fla. 33541.

CRT Compatible With DEC VT-52

PENSAUKEN, N.J. — Datamedia Corp has announced an alphanumeric CRT it said is compatible with the Digital Equipment Corp. VT-52.

The Elite 3052A offers formatting capability, eight levels of screen enhancements and a detached keyboard, according to a spokesman.

The unit is a buffered VT-52-compatible terminal with a single-page CRT memory that displays 1,920 alphanumeric characters in a 24-line by 80-character format. It offers a series of features for VT-52 users, according to Datamedia, that include:

- A range of operating modes — on-line, printer controller, hold screen, autocopy, format, format modified and transparent — to meet a range of applications requirements.
- Host control of the block transmit function in local or remote environments.
- Switch-selectable EIA or 20mA current-loop interfaces.
- Buffered support of host-to-printer data transfers.
- Ten user function keys for access to programs, formats, etc.
- Eight-level video, which required no memory address space.
- Fifteen transmission rates up to 9,600 bit/sec, selectable from keyboard.

The terminal, priced at $1,700, reportedly offers operating features that require no programming for interactive applications, data entry, information retrieval or any related data communications requirement.

Datamedia also announced a price reduction on its earlier 3025A CRT. The earlier CRT now costs $1,700.

Datamedia is at 7300 N. Crescent Blvd., Pennsauken, N.J. 08110.

TI's 745 Portable Data Terminal can make the difference between closing doors and closing deals.

Sometimes, getting back to your customers tomorrow or next week just isn't good enough. It can mean a closed door now. And more closed doors to future business.

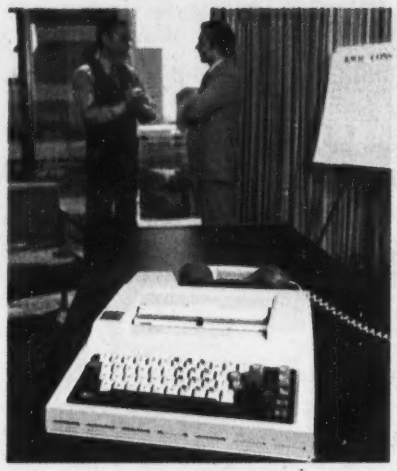
TI's *Silent 700** Model 745 Portable Data Terminal gives you all the facts and figures you need to close your sale. On the spot.

All you need is a telephone and an electrical outlet. And you're ready to send or receive information from your home office computer that's configured for remote-dialed communications. Immediately. Plus, you get an instant printed copy of the information for your records.

TI's 745 Portable Data Terminal weighs only 13 pounds. So, you can easily take it with you wherever you go. And get virtually silent printed copies of critical orders at 30 characters-per-second. Inventory. Pricing. Deliveries. Listings. Policy analysis. And budget impact analysis.

With a TI microprocessor at the heart of the unit, the 745 is unbeatable for performance and reliability.

And with a price of only $1995†, the 745 is several hundred dollars below competitive models. With larger quantity discounts available, too.



So, if you're in real estate, insurance, finance, manufacturing, wholesale, retail or any other business with field operations, put our 745 to work for you. And start closing more deals.

For immediate response, contact your nearest TI office, or call Data Terminal Marketing, Texas Instruments Incorporated, at (713) 491-5115, extension 2126.

Or for more information, simply return this coupon.

TEXAS INSTRUMENTS
INCORPORATED

Yes! I am interested in the Model 745 Portable Data Terminal.

SILENT 700 electronic data terminals

☐ Please have your representative call me.
☐ Please send me more information.

Name _____
Title _____
Company _____
Phone _____
Address _____
City _____ State _____ Zip _____

Mail to: Texas Instruments Incorporated, P.O. Box 1444, M/S 784
Houston, Texas 77001 12-5-CW

*Trademark of Texas Instruments

Copyright© 1977, Texas Instruments Incorporated
†U.S. Domestic Price

TEXAS INSTRUMENTS.

DECwriter II's & III's
FOR SALE
• LA36 • LS120
BEST PRICE • FAST DELIVERY
CALL TOLL FREE 800-323-2288
IN ILL. CALL 312-279-1960
Data Equipment Group
ICE, INC.
772 N. Church Rd.
Elmhurst, Ill. 60126

Commercial Banks, S&L Share Kansas EFT Net

TOPEKA, Kan. — A group of seven commercial banks in Kansas has teamed up with the state's largest savings and loan (S&L) association to share an electronic funds transfer (EFT) system that supports point-of-sale (POS) banking transactions through a central switching center here.

More than 40,000 banking customers in four cities in the state currently have access to the network.

The two systems in the EFT network are the Zip Card System and the Moneymatic System. The Zip Card System was developed by Merchants National Bank and the Moneymatic System is operated by Capitol Federal Savings and Loan Association, both here in Topeka.

National Sharedata, the Western Union Teleprocessing, Inc. division which manages the DP operations of Merchants National Bank, designed and implemented the Zip Card System for the bank.

First Such Interface

The EFT switching network is the first to be interfaced in this fashion, tying in the computer facility of a commercial bank with the computer facility of an S&L and accommodating POS banking transactions, according to a spokesman.

The switching network links National Sharedata's IBM 370/145 with Capitol Federal's IBM 370/138. National Sharedata's Topeka computer center ties in with 16 Diebold, Inc. Model 610 automatic teller machine (ATM) terminals located in Topeka, Emporia, Lawrence and Manhattan.

Capitol Federal's Moneymatic computer system ties in with 37 IBM 3608 POS terminals located in various supermarkets in the state. These remote terminals are connected to Capitol Federal's facility by Western Union communications lines.

The Zip Card System, operational virtually around the clock, also permits banking customers to conduct banking transactions at unmanned "Zip machines" located in bank lobbies and other sites away from their banks, including three major universities.

"With the seven banks sharing the network now, there are more than 40,000 accounts representing nearly 70,000 Zip cards in the hands of customers who can use either Zip machines or moneymatic terminals," according to Oliver H. Hughes, chairman of the board and chief executive officer of Merchants National Bank.

To use the Zip system, customers are provided with a plastic Zip card with embossed lettering showing the customer's name, cardholder number and name of the bank. Insertion of the card activates the ATM so customers can make deposits or withdrawals, transfer funds, make loan payments, request their account balances or leave messages for the bank concerning their accounts.

"For security, a personal identification number [PIN] has been assigned to each customer and is known only to the customer," according to Steve Michell, vice-president of National Sharedata and manager of the Topeka computer facility for Merchants National. "It takes both the plastic card and the punching in of the PIN to complete a transaction."

IDS Expands Minitech Line With Tester of EIA Cables

PROVIDENCE, R.I. — International Data Sciences, Inc. (IDS) has expanded its Series 8500 minitech modules with the Model 8580 EIA cable tester.

The Model 8580 is a portable EIA cable tester that indicates opens, shorts and miswired conductors in connectorized cables up to 50 feet, IDS said. An EIA 25 conductor cable is tested by coupling both ends to rear-panel connectors and rotating a front-panel switch through each of its 25 positions while pressing the "Cable Test" momentary switch.

Four rear-panel connectors allow the 8580 to test cables with either male or female connectors at either end.

Faulty conductors are indicated at the front panel by three red LEDs that light for each of the different fault conditions; a buzzer sounds an alarm. The 8580 lights a green LED when the cable conductor matching the current switch position is in good condition.

The unit is housed in a desktop aluminum case, sized for use both in the field and in the technical control center, the spokesman said. It is powered by a long-life dry cell or by an optional ac adapter/charger unit and Nicad batteries, the firm noted.

The Model 8580 costs $395, IDS said from 100 Nashua St., Providence, R.I. 02904.

PTS-100 Gains Impact Printer

NORWOOD, Mass. — Raytheon Data Systems, Co. has introduced a 45 char./sec printer for use with its PTS-100 line of programmable terminal systems.

The Model 3408 is a microprocessor-controlled impact printer designed for use in applications requiring typewriter-like output quality. It features a servo-controlled daisy wheel-type font — either Courier or Pica — which produces "sharp fully formed" characters on one- to six-part forms, the company claimed.

In addition, the Model 3408 features switch-selectable form feed in increments from one line to 14 in., a full Ascii character set and a 132 char./line by 6 line/in. format.

The Model 3408 is supported by Raytheon Data Systems' PTS-100 communications-oriented processor, which can support up to 32 CRT terminals and up to 24 low-speed interfaces, a spokesman said.

The 3408 prints a predetermined parity error character in place of a character received with parity error.

The Model 3408, available for immediate delivery, is priced at $6,555 and rents for $191/mo and $176/mo on one- and two-year lease/maintenance contracts respectively. Raytheon is at 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

• DECwriter • Beehive
• Lear Seigler • Teletype terminals
• ADDS • GE Terminets
• Hazeltine • TI, etc.

Users Save 50%

Add Comm-Stor II to your dumb terminals and save 50% of the cost of purchasing a new intelligent terminal. Comm-Stor II provides: local disk storage, editing, forms data entry, IBM 3740 EBCDIC and format compatible and high speed communications. Immediate delivery and local service.

Price: $2825 single drive quantity one, USA.

Call Toll Free 800-828-6308

In New York State call collect 1-716-458-2216

SYKES

SYKES DATATRONICS INC.
375 ORCHARD ST.
ROCHESTER, N.Y. 14606

OUTSTANDING SALES CAREER OPPORTUNITIES CALL LARRY SAMARTIN 716-458-8000

SAVE

Diskettes: Single, Dual, Mini, Disc Cartridges, Data Modules, Computer Plus much more!!

ANSCO's Great May Promotion

Most D.P. Supplies reduced as much as

40%

CALL TOLL FREE FOR YOUR FREE CATALOG OF SUPER VALUES!

ACT NOW!
OFFER EXPIRES
MAY 31, 1978

AMERICAN NATIONAL SUPPLY CORP.

TOLL FREE PHONES:

800·421·1270

Calif. Collect

213·532·7780

IN?UIRY/ims

An English-like Interactive Language for IMS

Designed to maximize user responsiveness while preserving IMS performance integrity

The only interactive system which offers ...

- Operation as a MP, BMP, or DL/I Batch
- Full Support of MULTIPLE, PHYSICAL, LOGICAL, Data Bases
- Communications under IMS/DC and/or TSO
- SORTING ON and/or OFF-LINE
- FULL ARITHMETIC capability
- Capability to DEFER ON-LINE QUERY to BATCH
- FULL REPORTING Capability
- SUPPORT of ALL TERMINAL TYPES
- PRE-STORED Inquiries and Arithmetics
- MFS Support
- ALTERNATE TERMINAL Output
- INQUIRY PAGE and TIME LIMIT Options
- TERMINAL LEVEL Data Field and Value Security
- TRANSPARENT SECONDARY INDEXING

If you want complete capability, and maximum performance you should investigate IN?UIRY/ims (be sure to speak with our users).

cga COMPUTER ASSOCIATES INCORPORATED

Please Send me:
☐ BROCHURE
☐ TECHNICAL MANUAL

Name _____
Title _____
Company _____
Address _____
City/State/Zip _____
Telephone _____

CGA COMPUTER ASSOCIATES, INC.
1370 Piccard Drive
Rockville, Maryland 20850
(301) 948-9600

Univac Adds CPU, Data Entry System

• 90/40 Makes Formal Debut

By Frank Vaughan
CW Staff

BLUE BELL, Pa. — Univac has formally announced its medium-scale 90/40, which fills part of the gap in the mainframer's 90 series and provides an upgrade path for users of the older 9000 series CPUs. The system had been described to more than 400 members of the American Univac Users Association at a recent meeting [CW, April 17].

The 90/40 extends the range of the present 90/25 and 90/30, a spokesman said, noting that the 90/40's 500 nsec cycle time (for each 2-byte half word) and a different instruction access method give the system an improvement of approximately 30% over the 90/30's processor speed.

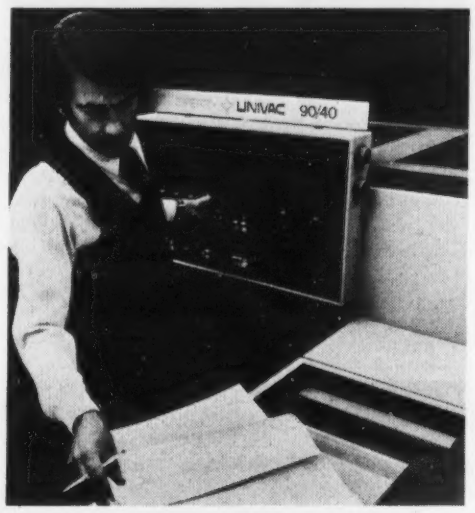
The disk-oriented system's processor, is under microprogram control and is organized with an 8-bit byte and 2 byte/fetch. The CPU has 16 registers for program functions, 16 for supervisor functions and four for floating-point arithmetic.

The 148-instruction set includes 44 floating-point instructions, the spokesman said.

The system comes with 512K bytes of MOS semiconductor memory and can be expanded to 1 Mbyte in 128K-byte increments. The minimum disk storage is 200 million bytes on two drives of the firm's 8430 disk subsystem.

Disk storage capacity can be increased to a maximum of more than 3 billion bytes. The 8430 drives are field-expandable to the 200 million-byte Model 8433 drive units, the spokesman claimed, pointing out that the 90/40 also supports dual-access capability for 8430 and 8433 disks.

(Continued on Page 53)



The 90/40 (above) is the largest Univac system that uses the OS/3 operating system. The 512K-byte CPU can be expanded to 1M byte in 128K-byte increments. The UDS 2000 (below) is a key-to-diskette system that can be used in a distributed data entry environment.

• UDS 2000 Joins Lineup

By Howard A. Karten
CW Staff

BLUE BELL, Pa. — A user-programmable, microprocessor-controlled key-to-diskette system aimed particularly at distributed data entry users has been introduced by Univac.

The Universal Distributed System 2000 (UDS 2000) is intended for use mainly in distributed or decentralized DP and is equipped with an Advanced Micro Devices, Inc. 2901 microprocessor containing 32K bytes of memory.

The memory can be expanded to 64K bytes in 8K-byte increments and gives the system the ability to use a subset of Cobol for some simple programs, according to a spokesman.

Three communications protocols — binary synchronous, Univac's Uniscope 100 terminal line protocol and Univac Data Link Control (UDLC) — give the system the ability to be used alone or as a remote entry or communications terminal, the spokesman noted.

The basic UDS 2000 consists of a master workstation with 32K bytes of memory, a 9-in. dot matrix display CRT with a 512-char. display, a keyboard and a floppy disk drive. Optional attachments include the previously announced Univac 0786 character printer and the Univac 0781 line printer.

Two optional I/O devices announced with the system are the Model 0875 9-track tape drive, available in 800 bit./in NRZI or 1,600 bit/in. phase-encoded versions, and the Model 8421 free-standing diskette drive.

The basic system can be expanded to a total of four workstations, a maximum of four drives (disk or tape, in any combination) and two optional printer subsystems, according to the spokesman.

System Software

Several software offerings are available with the UDS 2000. An interactive program performs a dialogue with the user to determine the format used for data entry; this can then be saved for reuse, eliminating the need to enter it again. Each of the keystations can reportedly use a different format program, Univac said.

A limited subset of Cobol is also available, priced separately, and the Cobol compiler includes diagnostics used in program development, the company noted.

Other software reportedly includes reformatting programs, tape and diskette-to-diskette utilities, tape- or disk- to print utilities, a communications utility and a control

(Continued on Page 53)

Add-On Fits IBM 30 Series

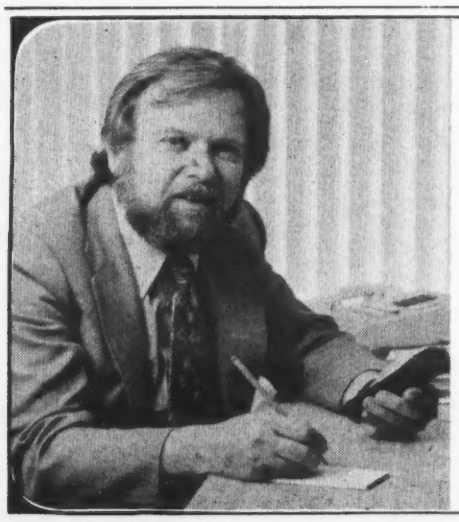
BEDFORD, Mass. — Cambridge Memories, Inc. has introduced add-on memory for IBM 30 series CPUs.

The Stor/3000 models 31, 32 and 33 are fully compatible with the IBM 3031, 3032 and 3033 respectively, a spokesman claimed, adding that the Stor/3000, is the same basic memory system Cambridge has been selling for the 370/158 and 370/168 CPUs.

The memory, based on 4K static MOS elements, is slaved to the IBM CPU, so its speed matches the needs of the 30 Series CPU, he claimed. It can also use IBM's single-bit error-correction and double-bit error-detection logic, he added.

Stor/3000 comes in 2M-byte increments and will "probably" be available up to a 16M-byte maximum, the spokesman said, observing that the firm will sell each 2M-byte increment for "approximately $170,000," Lease prices have not yet been established, he said.

Deliveries are expected in the third quarter of this year from the firm at 12 Crosby Drive, Bedford, Mass. 01730.



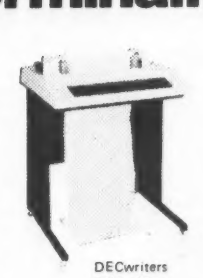
I've got the sharpest pencil... when you want to buy a terminal...

Hi... I'm Bert Rudofsky, President of MTI Sales, and if you're looking for terminals or accessories, you can stop looking!

We've got it all, from DECwriters and DECscopes to Modems and Couplers. We've also got the service and the know-how with full factory backup to help the new guy get started in data communications or the old pro update his system for more efficient operation.

It all means that when you need computer peripherals, you can count on me and the MTI professionals to give you the best deal, best delivery and fastest service.

Buy, lease or rental plans available. Give me a call at 516-482-3500, 212-895-7177 or if you're outside New York 800-645-8016... thanks.



DECwriters
DECprinters

Terminals

DECscopes

mti

159 NORTHERN BOULEVARD ▪ GREAT NECK ▪ N.Y. 11021

When you buy from MTI you get a price advantage and a lifetime friend you can count on!

Firm's Moves Made Faster

Portable Power Short Circuits Hard-Wire Fees

Special to CW

LOS ANGELES — "Although our computer system remained in the same room over the past four years, the numerous hardware additions and system reconfigurations we undertook during that time cost us over $80,000 in electricians' fees for the conventional, hard-wired power hookups we were using," Rodney Fragodt, manager of computer operations for William O'Neil & Co. here recalled. "The portable power center we now have would have eliminated nearly all of that expense."

William O'Neil is a research firm of investment advisors that publishes weekly analyses of stock market activity. A large-scale Burroughs Corp. B6700 is the heart of the firm's analytical and publishing operations.

"Last September we moved into our present facility — and because of our previous experience with high reconfiguration costs, we decided to provide our computer room with a moveable power system instead of using conventional hard-wired conduits," Fragodt explained.

The movable power system, a Data Processing Power (DPP) Model AD-125 Powermobile, provides a means of distributing power to the equipment through cables from a free-standing central unit about the size of a typical peripheral. Connected to utility power by a junction box under the floor, the unit includes a transformer to provide the various voltages needed.

"The Powermobile really made a difference in the ease of moving in to our new facility," Fragodt recalled. "When the floor was ready, we just rolled the unit in and connected the junction box, which took about an hour.

"The manufacturer had already prepared the various flexible cables to our specifications. All I had to do was place the hardware units where I wanted them, pull up two or three tiles at a time from the floor, throw the flexible cables underneath and connect them.

"If I had been running permanent conduit, I'd have had half of the floor ripped up, with electricians all over the place making permanent connections, and my computer system would have been down three or four days longer," he added.

Small Actual Cost

"The actual cost of the 125 KVa Powermobile — about $15,000 — was roughly equal to what a typical permanent-conduit installation (including one isolation transformer) in a facility this size would have cost in initial outlay," Fragodt estimated.

In this particular case, however, the need for a second isolation transformer to protect a sensitive peripheral from voltage transients would have boosted the cost of the hard-wired installation well above that of the Powermobile.

"We use a sensitive microfilm graphics machine, the Information International, Inc. FR-80, to provide microfilm output of our stock market analysis charts, and this unit requires its own isolation transformer if it's used in the same system with noisy peripheral equipment such as a line printer," Fragodt explained.

"If we'd used the hard-wired approach, this would have meant buying a $5,000 isolation transformer for the FR-80 in addition to the one needed for the system as a whole.

"Using the movable power system approach, there's no need for that separate trans-

(Continued on Page 51)

3330/33
DISK DRIVES
3330 Models I and II immediately available for sale or lease
COMDISCO
312-698-3000

Documation's new breakthrough gives you all the advantages of impact printing at laser graphic throughput rates

Call John Sterling (800) 327-6424 or (305) 724-1111 or your local Documation representative: Atlanta, GA 955-0309 Boston, MA 890-2650 ☐ Chicago, IL 782-0551 ☐ Dallas, TX 661-9902/750-6160 ☐ Detroit, MI 353-8181 ☐ East Meadow, NY 794-1186 Greenwich, CT 869-4123 ☐ Hartford, CT 278-2010 ☐ Houston, TX 780-1432 ☐ Irvine, CA 752-8782 ☐ Long Beach, CA 595-6775 Miami, FL 592-9655 ☐ New York, NY 695-4195 ☐ Newark, NJ 686-5223 ☐ Oak Brook, IL 920-0551 ☐ Philadelphia, PA 337-2850 San Francisco, CA 574-4060 ☐ Washington, DC 356-2050 ☐ International Offices: London—Staines 61124 ☐ Paris 686 8007 Germany 0611-762 055 ☐ Spain 416 87 60.

RAM Fits Criterion CPUs

COSTA MESA, Calif. — The Ram-Stor 8000, a random-access memory (RAM) Module designed to be interchangeable with memory modules for NCR Corp. Criterion CPUs, has been introduced by the Computer Enhancement Corp.

The module is both hardware- and software-compatible with the Criterion CPUs, according to Computer Enhancement, which also claimed it is in compliance with "NCR's policies regarding foreign attachments."

However, an NCR spokesman, said "we don't know what [Computer Enhancement] means by 'NCR's policies regarding foreign attachments.' Like other vendors, we can assume no responsibility for what happens if foreign attachments are made to our Criterion systems."

The Ram-Stor's hardware and software compatibility with Criterion models 8450 through 8570 is achieved by using 4K-bit chips; compatibility with the larger 8580 and 8590 models is achieved using 16K-bit chips, a spokesman said.

Prices for the modules start at $7,000 from the firm at 3189-E Airway Ave., Costa Mesa, Calif. 92626.

Hard-Wire Fees Saved

(Continued from Page 50)

former. Every piece of gear in the computer room, including that FR-80, is running off the Powermobile unit — with no noise problems."

$80,000 Lost

When Dinesh Patel, vice-president, and Fragodt first approached top management about the savings a movable power system could provide, the initial reaction was one of disbelief.

"I think financial executives often can't see the direct advantages of a unit like this," Fragodt pointed out, "because they don't see the future growth that's coming and all that goes on in the course of two or three years with equipment moving in and out. So much of this cost is just 'absorbed' — and it's not any big number that sits in an account book and jumps out at you.

"Fortunately," Fragodt said, "I had kept good records of all of the electrical contractors' expenses involved in system expansions and reconfigurations during the four years we were located in the Tishman building in Westwood, Calif.

"Initially we installed a B5500 system that we had been using at another Los Angeles location. Once that was in, we decided to add a minicomputer to augment our capabilities. Then we decided to upgrade to a B6700, and the mini was pulled out.

"For six months we ran the 5500 and B6700 in parallel and then pulled out the B5500. Then, finally, we reconfigured the B6700 to expand it and make better use of our space.

Every Change Costs

"Every one of these changes required electricians to rip out and reinstall permanent conduit — and the total four-year expense came to over $80,000.

"If we'd had a portable power center rather than using permanent conduit during those moves, the savings would have been astronomical. To add insult to injury, when we left these locations we had to pay to have the permanent conduit ripped out," he continued.

Because of the vast quantity of stock market data which must be gathered, analyzed, charted and published for subscribers on tight weekly deadlines, O'Neil could not afford to have its system down longer than absolutely necessary — even while moving.

"So when we moved last September," he said, "it had to be done on a very tight schedule. If we'd gone the permanent-conduit route, the three or four days we'd have lost while the electricians were laying the cable would probably have cost us several thousand dollars in processing time at a backup site."

Introducing
IMPACT 3000

World's fastest Impact Line Printer
Documation's technology breakthroughs increase throughput to 3000 lines per minute. With 6 copy capability impact printing now yields throughput rates up to 18,000 lines per minute per printer.

More throughput per dollar invested
Cost of ownership of three IMPACT 3000 line printers is less than a single IBM 3800, providing you significantly lower cost redundant reliability. What's more, IMPACT 3000 productivity increases as the number of copies increases. Laser graphic productivity decreases.

Forms flexibility
IMPACT 3000 provides printing on any forms 3 to 18¾ inches wide and 3 to 24 inches deep. More than twice the form depth of laser graphic capability.

No additional programming required
Any 360/370 channel (or PCM mainframe channel) will support multiple IMPACT 3000 line printers. And, IMPACT 3000 requires no additional system or application programming.

Just four of the many reasons why you should investigate Documation's IMPACT 3000 as a viable alternative to laser graphic printing.

For more information on IMPACT 3000 write Documation Incorporated, P.O. Box 1240A, Melbourne, FL 32901 or call your local Documation representative for a detailed comparative analysis.

DOCUMATION
INCORPORATED

Lear Siegler CRT's
For Sale
ADM Series
1, 2 & 3
BEST PRICE • FAST DELIVERY
CALL TOLL FREE 800-323-2288
IN ILL. CALL 312-279-1960
Data Equipment Group
ICE, INC.
772 N. Church Rd.
Elmhurst, Ill. 60126

DIGITAL SALES REPS DON'T JUST SELL A GOOD DEAL. THEY GET ONE.

We've always been known for giving our customers the best deal in the computer industry.

And what goes for our customers, goes for our people. Take Sales Representatives.

The first part of the good deal for you is what you get to sell. Great product. At a great price. With great delivery. Year after year.

If you have the kind of experience we're looking for, you already know how important that is.

And that's just the beginning.

Instead of chasing a changing commission plan, you're leading a team.

The next thing we give you is a good professional salary. Because we see you as an important corporate resource.

On salary, your whole world changes. You're backed by a full support team. Software specialists and applications experts, right there with you when you need them. Home office marketing groups, ready to travel. Other sales people who work with you as partners instead of competitors.

You can even take time out from the field for courses in personal and professional development. And your future earnings are as secure as your dedication to the job.

We'll offer you an opening almost anywhere you want.

Right now we have openings for good Sales Representatives all over the country. No matter what your market specialty, we can use you. So if you absolutely love New York, or simply can't leave Atlanta, we can probably accommodate your needs. With ease.

At Digital, there's room at the top.

Within our sales organization, we give you two ways to move up—into management, or into senior levels of selling. But we also offer you the opportunity to move into anything else you like. You can get into marketing. Product development. Manufacturing. Whatever. Starting from sales, just like many of our top management.

And there's more.

A substantial benefits package that's among the best in the industry.

The resources of a billion dollar company with the vitality of a bright young business.

Corporate growth of over 30% each of the last five years.

New products coming out at the rate of one every two weeks. And even more.

Call us today.

For a complete brochure package on opportunities for the Sales Representative at Digital, simply call (in complete confidence) one of these numbers:

Northeast, **800-225-8335** (in Mass., 617-890-0330); Mid-Atlantic, **800-526-3877** (in N.J., 201-496-9211); Southeast, **800-438-1374** (in N.C., 704-525-7150); Midwest, **800-323-6692** (in Ill., 312-640-5500); Southwest, **800-231-8008** (in Tex., 713-977-7575); West Coast, **800-421-1887** (in Cal., 213-640-1830).

You can talk to a Sales Manager Tuesday and Wednesday, 5-8 p.m. Or call Monday-Friday, 9 a.m.-5 p.m.

And find out why our customers aren't the only ones that get the best deal.

Bob Nephew, NORAM Central Employment, Digital Equipment Corporation, Dept. H403 3807, 129 Parker St., Maynard, MA 01754.

digital

An equal opportunity employer M/F

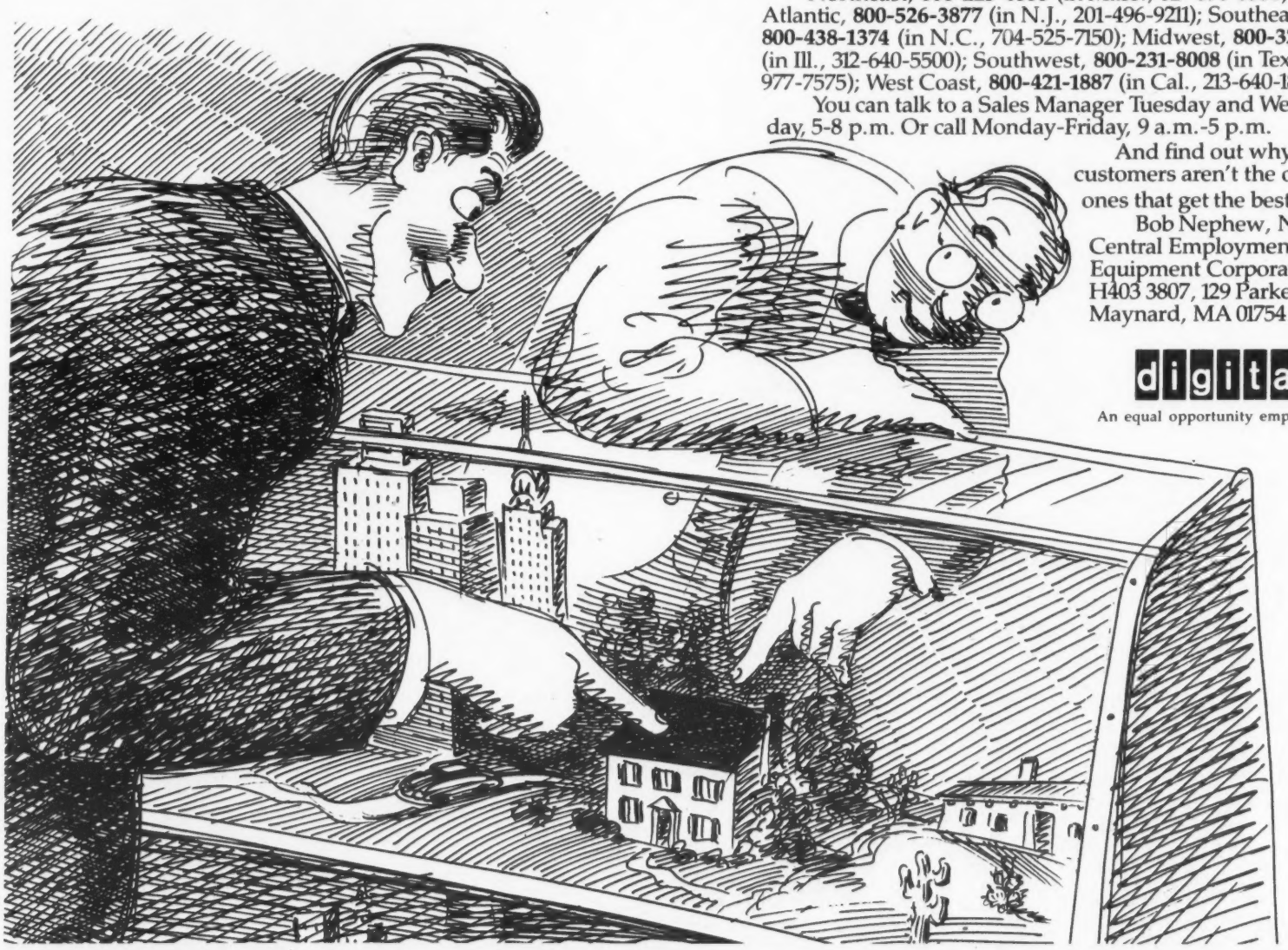


Image Processor Does Arithmetic

SUNNYVALE, Calif. — Stanford Technology Corp. has announced an image-processing system capable of performing four arithmetic operations and a range of Boolean operations on digitized graphic data. The Model 70 can interface with most of the minis now being marketed, according to the company.

The system can perform arithmetic operations at a rate of 10 million/sec, the company said, and is compatible with National Television Standard Code (NTSC) formats on both input and output. In addition, the Model 70 has three pipeline processing channels, one for each of the primary colors, which are selectively fed by any or all refresh memory channels, the firm explained.

Image-processing computers operate on pictures that have been converted to digital format, the firm said. This allows digital computers to process the data in various ways; for example, blurred images (in digital form) can be manipulated so as to clarify them or before-and-after pictures can be mathematically compared. The process was originally developed for use in satellite transmission of data, a company spokesman added.

Other features of the Model 70 reportedly include a hardware histogram generator, display of graphic overlays and cursors in up to 32,000 colors, a maximum of 12 channels of image refresh memory and multiple independent CRT monitors. In addition, a programmable processor is used to control and direct a large variety of system operations and to provide internal access to the complete array of the system's operational modules, the spokesman said.

The company said it has also developed software which lets the user link the system and a host computer.

Model 70 prices range from $30,000 to $150,000, depending on capacity and options. Stanford Technology is located at 650 N. Mary Avenue, Sunnyvale, Calif. 94086.

Line Compensators Bow

SAN DIEGO — A family of ac line compensators designed to attack the problem of low ac line voltages has been introduced by the California Instruments Co. here.

The LR series line compensators permit fully regulated output with input voltages ranging from 84 Vac to 132 Vac. They were designed to quickly recover to regulated output with an input line reduction up to 75% of nominal, the company said.

The units were developed for instrument rack mounting and come with cooling fan, circuit breaker and high/low voltage indicators. They are available in power ranges up to 5 kva and are capable of accepting input voltages of 115-, 208-, 220-, 230- and 240 Vac.

Prices range from $995 to $4,195. The company is at 5150 Convoy St., San Diego, Calif. 92111.

Univac Key-to-Diskette System Bows

(Continued from Page 49)

program that runs the whole system and must be generated when the system's configuration is changed.

The master workstation has a 96-character keyboard with national character fonts available for the Scandinavian countries, France, Italy, Spain, the Netherlands, Germany and the UK; a 128-character set in Katakana (a Japanese character set) is also available. The keyboard itself can be supplied as a typewriter, a keypunch or a keypunch/adding machine, Univac said.

The system can reportedly interface to a CPU via the use of the Univac Direct Connection Module (DCM) to transmit data directly or can transmit from a diskette or magnetic tape subsystem. Transmission speeds are 2,000, 2,400, 4,800 or 9,600 bit/sec in half-duplex mode, over switched or non-switched lines, the spokesman said.

The UDS 2000 does not require a raised floor or special environmental considerations, he said, and first deliveries are slated for August.

Purchase price for an entry-level UDS 2000 system, with 32K bytes of memory and one keystation, is $9,798, or $208/mo for rental and maintenance on a 5-year lease. A version with three keystations and a 200 char./sec printer costs $25,262 from the company at P.O. Box 500, Blue Bell, Pa. 19422.

90/40 Debut Now Official

(Continued from Page 49)

The 90/40 uses the same OS/3 operating sytem as the smaller models in the 90 series. OS/3 provides multiprogramming of up to seven jobs concurrently, I/O spooling, job scheduling and a data management system.

Other existing software products offered for the 90/40 include the Information Management System 90 (IMS 90), which permits on-line data entry; Data Base Management System 90 (DMS 90), which performs the typical data base functions; and Information Collection System 90 (ICS 90), which supplies a preformatted, fill-in-the-blanks approach to data input.

The 90/40 multiplexer channel will accommodate up to eight I/O subsystems and has a 99 kbyte/sec throughput rate. The two selector channels will also handle up to eight I/O subsystems per channel with a 1M byte/sec throughput rate for each channel, the firm said.

The communications adapter will handle 12 half- or 24 full-duplex lines with speeds of up to 56 kbit/sec.

Optional peripheral devices include 500-, 600- or 1,000 card/min readers; a diskette reader with speeds ranging to 1,500 record/min; 75- to 160 card/-min punches; 300-, 500-, 750-, 900-, 1,400- or 2,000 line/min printers; and CRTs with 16 lines of 64 char./line.

A basic system with 512K bytes of main storage, disk control and a communications adapter sells for $304,272 and rents for $7,089/mo on a five-year lease with maintenance.

First deliveries are expected to begin next month, the firm said from P.O. Box 500, Blue Bell, Pa. 19422.

trapped

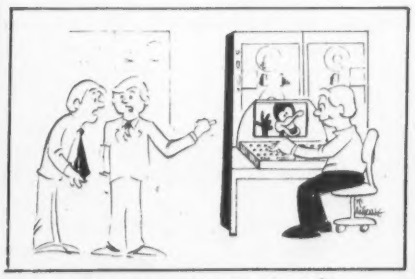
In the Payroll Jungle?

It's easy . . . take one obsolete payroll, add eight ERISA earnings, ten HMO deductions, one long form W-2 and one Vice President screaming about an EEO violation and you sure can get trapped . . .

The solution is easy . . . up-to-date Wang payroll/personnel/ERISA software for your IBM/Burroughs/Honeywell/Univac system . . .

For more, call Joe Nestor (617) 851-4111, Wang Laboratories, Inc., Lowell, MA 01851.

WANG



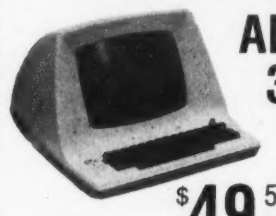
'How Does He Do That?'

TERMINAL RENTALS

MODEL 43 TTY $67.50 MONTH

33 ASR-FF $54.00 MO.
TWX-DDD 79.50 MO.
TELEX 76.50 MO.

33 KSR-FF $49.00 MONTH

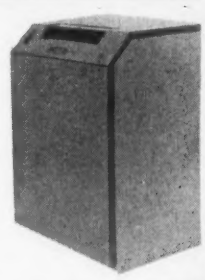


ADM-3A $49.50 MONTH
ADM-1A — $73.00 mo.

COUPLERS/MODEMS

TC 3002 O/A Acoustic 12.00 mo.
TC 5001 202T 18.00 mo.
TC 4001 113B Auto-Ans. 18.00 mo.

MODEL 40 TTY LINE PRINTER 300 LPM $325.00 MONTH



All equipment includes national service
Get complete details with a direct call:
800/527-7700
or 214/252-7502 • Service 800/527-5608
TWX 910/806-5761 • TELEX 73-0022

vardon & associates, inc.
930 N. Beltline Road • Irving, Texas 75061
A Subsidiary of Pioneer Texas Corp.

SERVICE PROBLEMS?
NATIONWIDE SERVICE
356 CITIES
CALL
800/527-5608
IN TEXAS CALL
800/492-9602 or 214/258-2620

The new MDS 21/50. Series 21 grows

Mohawk Data Sciences announces System 21/50, the latest member of the Series 21 family of distributed processing systems.

System 21/50 doubles the power and doubles the capacity of Systems 21/20 and 21/40—but retains the pricing breakthroughs that have made Series 21 a worldwide solution to data entry, stand-alone operations and distributed processing requirements.

A System 21/50 performs multiple functions, uses high-level language, and does the local office processing you need right now. And the System 21/50 grows with you. With main memory up to 128K. With disk storage to 20 megabytes. With printers from 45 cps to 600 lpm. And with magnetic tape drives and communications options as you need them.

CW5178

Mohawk Data Sciences
1599 Littleton Road, Parsippany, New Jersey 07054

Send me information on the MDS Series 21

☐ System 21/50 ☐ System 21/40 ☐ System 21/20

Name_____

Title_____

Company_____

Street_____

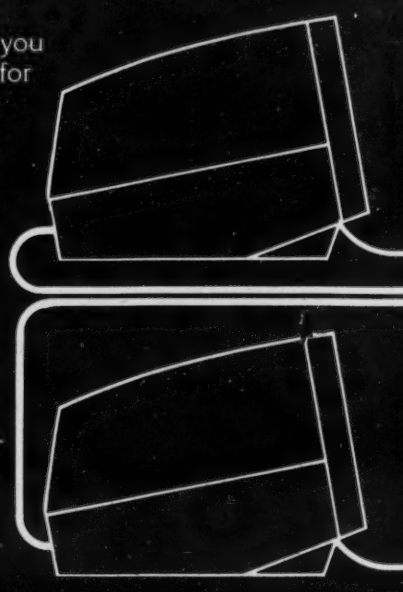
City_____

State_____ Zip_____

☐ I'm in a hurry. Have a representative call.

Series 21, MOBOL and MDS are trademarks of Mohawk Data Sciences.

Now, with three Series 21 systems to choose from, you can mix and match just the right amount of power for your dispersed locations. System 21/20 for easy conversion of source documents using the MDS Formatted Data Entry Software package. Next, the System 21/40 for local processing power in small offices. It uses our simple, yet powerful MOBOL (MOhawk Business-Oriented Language) compiler. And now, the new System 21/50 for more sophisticated applications requiring multi-programming, larger internal memory, and faster processing speeds. Every Series 21 system has built-in modularity—can easily be upgraded to accept additional memory and peripherals such as tape units, disk drives, and character or line printers. Best of all, Systems 21/20 and 21/40 can be expanded to the System 21/50.

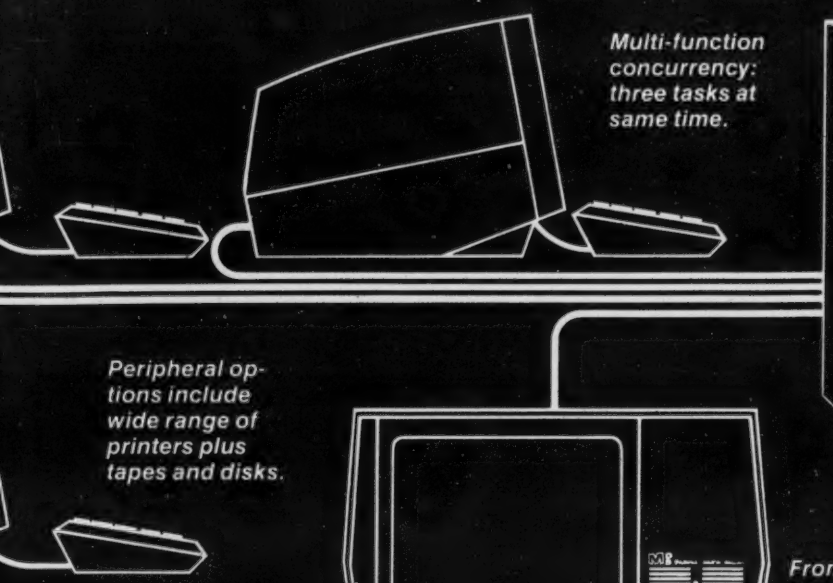


Remember, with Series 21, you are buying proven capability. For example, Series 21 equipment is helping to control manufacturing costs for a plant in Utah, preparing budgets for a governmental agency in Virginia, handling medical records for a hospital in Hawaii, performing distributed information retrieval for a steel mill in Germany, and processing customer records for a bank in Belgium.

Wherever in the world you find Series 21, you'll find MDS customer support and field engineering as well. Our 300 worldwide sales and service offices serve over 6,500 customers around the globe.

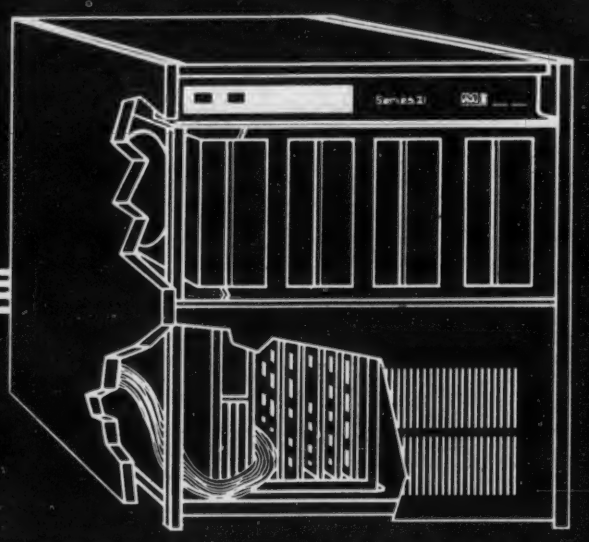
Send us the coupon right now, and learn more about the MDS Series 21—the one-stop solution to your distributed processing needs. Or call James J. Byrne, V.P. Sales, (201) 540-9080.

bigger for you.



Multi-function concurrency: three tasks at same time.

Peripheral options include wide range of printers plus tapes and disks.

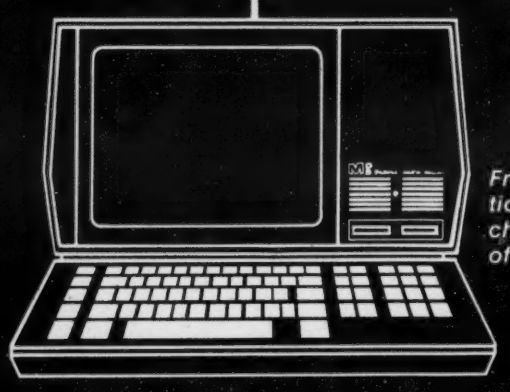


Disk storage capacity range: 2.5 megabytes to 20 megabytes.

Main memory expandable from 64K to 128K bytes.

Storage hierarchy includes single or multiple diskette drives plus hard disk.

Binary synchronous communications. Industry standard interfaces.



From 1 to 4 operator stations, each with 1920-character screen; choice of keyboard styles.

Two-level software: FDEP—easy-to-use formatted data entry package—and MOBOL high level user language. Comprehensive utilities.

MDS®

Mohawk Data Sciences

Mark your calendar now! Be there when the computer industry's most dynamic show comes near you!

The Computer Caravan's

COMPUTER EXPO 78

You're invited to see the latest and the best in:

Data Communications Terminals • Software • Minicomputers • Data Input Equipment • Computer Output Equipment • Supplies • Magnetic Media • Modems • DP Education • Small Business Computer Systems • Flexible Disk Drives • Data Communications Interconnect Equipment • Mini-peripherals • Magnetic Tape Transports • Cassette Systems • Power Supplies • Printer Terminals • Keyboards. And more.

Here are the companies who will be looking for you:

NCR
Varian Graphics
Informatics
Honeywell
Datamation
Communication News
McCormack & Dodge
Data Rentals
Computer Sales International
Intel
Electronic Ventures
Computer Roomers
Customer Priorities
Computer Software Solutions
Systems Marketing
S.E.A.
Tri-Data
Midwest Marketing
Logabax
AAA Chicago Computer
Intelligent Systems
Shasta
Mostek
DIVA
SBC Magazine
Tele-dynamics
Control Data

National Semiconductor
Printronix
Codex
Lear Siegler
E M & M
The Morley Company
Vanier Graphics
Total Typography
Wang Labs
Computer Devices
Ann Arbor Terminals
Datapro Research
Inforex
Perkin-Elmer
Telcon Industries
Versatec
Computer Performance
Advanced Systems
Delta Data Systems
Informer
Computer Decisions
Infosystems
T-Bar
Corporate Systems
YE Data
Arcus
St. Louis Info

Computerworld
NCI
AT&T
Kodak
BASF
IBM
Anderson Jacobson
Computer Input Services
Paradyne
ComData
Genesis One
Data Processing Sciences
Applied Computer Systems
Agile
Woodford Systems
American Used Computer
Business Forms Service
Itel Corporation
Deltak
Peripheral Products
General DataComm Industries
Continental Peripherals
Computer Associates
Qantel
Diablo Systems
Marketechs
Racal-Milgo

Data Systems Specialists
Key Tronic
Administrative Management
Small Systems World
American Terminal Leasing
Journal Systems Management
Optical Business Machines
McGunn Safe
Allstate Computer
H/G Professional Forms
Nichols & Company
Datapro
Input Services
Plessey Services
Industrial Computer Controls
Vincent Data Products
World Info Systems
DP Power
Conrac
Educational Data Systems
Cybertek
Cosmic
Business Automation
Insyte Datacomm
Herrera Kirby
Foto-fun
Hamilton Sorter

Trac Associates
Sperry Univac
Xerox
Sykes Datatronics
Cummins Allison
American Microprocessor
International Data Corp.
Programs, Inc.
Beehive International
Intertec Data Systems
Software AG
Creative Engineering
Graphic Controls
Mini-Computer Systems
Tandem Computer
PCC/Pertec
Computrend
Extel
Mentel
Sycor
Digitronics
Computer Services
Datamart
Courier Terminals
Modems Plus
Software Design
Curtis 1000

Spectron
K&K Associates
Applied Digital Data
Epic Data
Terminal Rentals
Applied Data Communications
Data Forms Company
Imperial Technology
Mathematica
Rianda Electronics
Computer Corp of America
Cullinane
Hewlett Packard
Pansophic Systems
Dynatech
Western Union
Calcomp
General Computer
Atlantic Research
Telefile Computer Products
General Electric
Qume
Moore Business Forms
DataMedia
Texas Instruments
Consolidated Computer
Cybersearch

Here's the schedule:

CHICAGO Midwestern Computer Expo	May 2, 3, 4 McCormick Place
NEW YORK Mid-Atlantic Computer Expo	May 9, 10, 11 New York Coliseum
DETROIT Great Lakes Computer Expo	May 23, 24, 25 Cobo Hall
BOSTON New England Computer Expo	May 30, 31, June 1 Northeast Trade Center

Show hours:
10AM to 5PM

No advance registration required. An exhibitor guest ticket or your business card will admit you.

THE COMPUTER CARAVAN'S

COMPUTER EXPO 78

The Computer Expo is produced by the Caravan Division of the Conference Company, 60 Austin St., Newton, MA 02160. (617) 964-4550.

MINI-MICRO WORLD

Mini Bits

DEC RF-11/RS-11 Gets Memory Replacement

SANTA ANA, Calif. — A core memory replacement for the Digital Equipment Corp. RF-11/RS/11 fixed-head disk system can accommodate eight memory modules and hold .5M- to 2M bytes of storage, according to the product's developer, Standard Memories/Trendata.

Buscomm DS-11 interfaces to processor systems through a DEC Unibus interface and is software-transparent to all DEC operating systems and diagnostics that support RF-11/RS-11 disk systems, a Standard Memories spokesman said.

Features with the unit reportedly include on-line/off-line switch, built-in self testing, selectable transfer rates to one million word/sec, selectable block transfer mode and user-assignable configuration controls, which the company claims minimizes downtime.

A typical Buscomm DS-11 memory system incorporates a memory controller, memory modules, display card, power supply and chassis.

A .5M-byte unit costs $15,790; a 1M-byte configuration, $26,790; a 1.5M-byte configuration, $37,790; and a 2M-byte configuration, $48,790.

All the configurations and technical data are available from Standard Memories/Trendata at 3400 W. Segerstrom Ave., Santa Ana, Calif. 92704.

RDOS Revision Supports Rolm Floppy Disk System

SANTA CLARA, Calif.— A recently introduced revision of Rolm Corp.'s Real-Time Disk Operating System (RDOS) supports the company's Model 3383 floppy disk system, according to company officials.

Revision 6.50 reportedly provides 11 enhancements to Rolm's previous RDOS features.

These enhancements include a redesign of the Fortran IV multitasking library to boost execution speed, the addition of macro commands to improve linkage to the outside when operating within files and added support for the asynchronous data communications multiplexer, a Rolm spokesman explained.

RDOS 6.50 is available free with the purchase of a Rolm Milspec computer system consisting of a Rolm processor with a 16K- to 32K core memory, real-time clock, terminal and a removable-medium storage unit, the spokesman said.

The product is available immediately on diskette, magnetic tape or magnetic disk cartridge. Rolm is located at 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.

NCC Slows Mini/Micro

Show Has Few Unveilings

By Jeffry Beeler
CW Staff

PHILADELPHIA — Although still five weeks away, this year's National Computer Conference (NCC) cast a lengthening shadow over last week's Mini/Micro '78 exposition here and turned what otherwise might have proved a lively event into little more than a warm-up for "The Big Show" starting June 5.

Many of Mini/Micro's almost 100 exhibitors, especially the peripherals and memory suppliers, readily admitted they could have introduced major products here. But with NCC in the background, most vendors elected to keep secret projects under wraps a while longer and save major announcements for maximum impact in June.

Another factor that inhibited activity at Mini/Micro was a more familiar bugaboo — the weather. A day of haze and intermittent rain did for visitor attendance what the proximity of NCC did for vendor announcements.

After a relatively heartening turnout of 2,310 visitors during the first day of the three-day event, attendance declined noticeably during the second day, although no precise figures were immediately available. Furthermore, one of the show's administrators held out little hope of dramatically higher attendance during the final day.

A source here blamed the modest turnout partly on the show's location. For the first time in years, Mini/Micro took place nearly 3,000 miles from its usual home in California.

The temporary move reportedly represented an attempt by organizers to prevent the show from becoming lost in the crowd of other conferences slated this year for the Anaheim, Calif., area, and they may have succeeded in their goal.

But in so doing, the organizers sacrificed much of the promotional muscle they might otherwise have enjoyed, and the attendance figures for the show reflect that fact, they conceded.

Variety of Visitors

Although Mini/Micro '78 might not have exerted as much drawing power as its administrators had hoped, it still managed to attract visitors representing a wide spectrum of professional interests and backgrounds.

Some attendees, such as a physician wandering among the long rows of exhibitor booths, admitted they had no immediate plans to automate their operations and were

(Continued on Page 58)

Canned vs. Custom Software: Novice Users' Quest Explored

By Jeffry Beeler
CW Staff

PHILADELPHIA — You are a corporate executive who has recently decided to outfit his firm with its first small business system. Not long after beginning the search for the right combination of hardware and software, you find yourself posting the same installation question that has vexed countless other first-time users for years: "What kind of applications software package should I get — off-the-shelf or customized?"

Two executives with firms that frequently deal with small systems novices addressed the canned-versus-customized-software issue during a seminar at the recent Mini/Micro '78 conference here.

Both Charles Muhle, director of marketing support at Basic/Four Corp. and David Brill, president of Brill Associates stopped short of explicitly endorsing one or the other type of package as the best solution for all small systems applications. User needs vary too much for one remedy to be universally applicable, they noted.

But the two speakers did outline some general software information and selection tips they said could help increase users' awareness of the potential strengths — and weaknesses — they can expect with both types of program packages.

Preferred Approach

Muhle predicted a growing preference among small systems users for canned applications packages. Although custom-written software has attracted many buyers during the years and will probably continue to do so for some time, most small businesses have neither the expertise nor the financial wherewithal to contract for such an alternative, he explained.

Muhle likened the selection of an applications package for a typical small business system to buying a new house. Instead of designing and building a dwelling tailored exactly to their domestic needs, most prospective homeowners elect to peruse the market until they find a model that strikes their fancy.

In most instances, they never find a home that perfectly satisfies their tastes and requirements. Instead, they make a few minor

(Continued on Page 60)

FIGHT TERMINAL INFLATION

NATIONAL COMPUTER Communications Corp.
The Greatest Name in Terminals

Call **800-243-9006** TOLL FREE

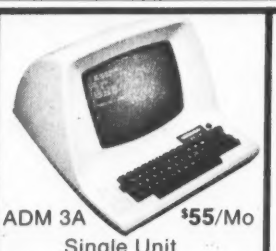
BOSTON 617-235-7055 NEW YORK 212-354-9866
CONN 203-325-3831 NEW JERSEY 201-768-4662
CHICAGO 312-296-0830

DIABLO 1620 $2,550

Also 1641/1660 available

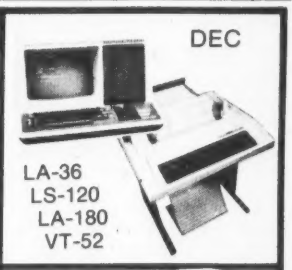
- Low Rates
- Fast Delivery
- 1 to 3 Year Rent/Lease Plans
- No Automatic Renewals on Any Rental or Lease
- Choice of Rent/Lease/Purchase
- Mix and Match Master Agreements

Techtran 8400 $1,795



ADM 3A **$55**/Mo
Single Unit

DEC



LA-36
LS-120
LA-180
VT-52

1 Year Rental

NCC-1043 (TTY-43)
132 Print Positions
As low as **$38**/Month

Also 765/743 733

T.I. 745 - **$92**/Month
1 Year Rental

Overshadowed by June NCC, Mini/Micro Has Few Unveilings

(Continued from Page 57)
sampling some of the most interesting displays simply to satisfy personal curiosity.

Most of the visitors, however, arrived at the show with a more specific objective in mind.

Michigan Attendee

John Holtzman, director of Village Green Management Co., traveled all the way from Southfield, Mich., to evaluate hardware for a system he is considering installing to speed his firm's financial and accounting operations. Holtzman, a self-confessed computer novice whose company manages more than 6,000 apartments, said he hopes to buy a micro and "play with it awhile, then figure out how to adapt it to our company's needs."

George Steelman visited Mini/Micro '78 for two reasons. As manager of the technical staff at the Palm Beach County, Fla., DP department, Steelman came here to inspect peripherals he hopes to add to his organization's communications network, which currently supports 80 on-line terminals. As co-owner of Sky, Inc. — a small microcomputer OEM that primarily serves the hobbyist and small business market — he came to evaluate processors for possible addition to his firm's product line.

'Some Disappointment'

Steelman said he had met with considerable success in his first goal and had found several terminal models that could fit easily into the Palm Beach County communications network. As for the second objective, he admitted some disappointment, primarily because some of the microcomputer suppliers he had hoped to meet never exhibited at the show.

Karen Rapkin, account executive with a New York City advertising agency, attended Mini/Micro '78 to gather background and marketing information for one of her firm's clients — Sharp Electronics Corp., which plans to enter the microcomputer business. Rapkin spent most of her time here attending some of the show's 24 seminars, which she said provided helpful hints about how to enter the computer manufacturing field.

She also visited a number of the exhibitor booths to find out about hardware availability in the microcomputer business and to help formulate her client's emerging marketing strategy.

HP1000 Memory Gets Price Cut

CUPERTINO, Calif. — Hewlett-Packard Co. has announced a 38% decrease in the prices of semiconductor main memory for its 1000 series computers.

With the reductions, the cost of the company's memory has dropped from five cents to 3.1 cents per byte, according to Richard W. Anderson, general manager of HP's Data Systems Division.

The price cuts mean that a 128K-byte, 560-nsec memory board that once cost $6,400 now sells for $4,000, Anderson said.

The reductions will especially affect large memories like the 512K-byte unit for M-series computers, HP officials added. Previously priced at $33,450, the M-series now costs $21,750.

Add-On Fits LSI-11

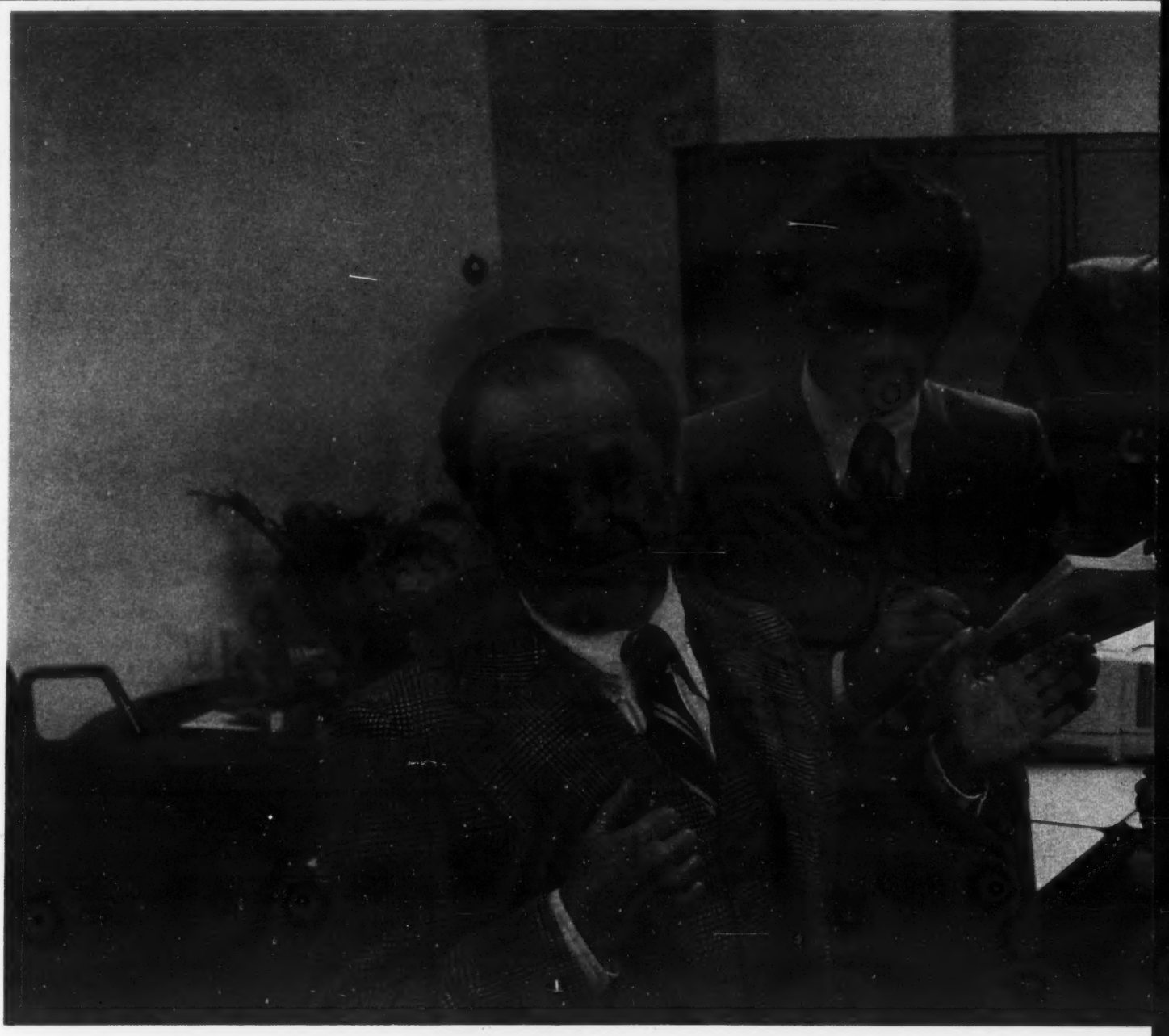
CRANBURY, N.J. — A 16K by 18 core add-on memory for users of Digital Equipment Corp.'s LSI-11, LSI-11/2 and PDP-11/03 is now available from Dataram Corp.

Claimed by its developer to be the largest LSI-11-compatible add-on currently available on the market, the DR-115 accesses in 425 nsec and cycles in 1.15 microsec, Dataram officials said.

Also available in an 8K by 18 configuration, the unit comes on a DEC quad board and operates with 5V and 12V, the spokesman added. DR-115's 18-bit word length reportedly allows either parity or nonparity operation.

In its 16K by 18 configuration, the product costs $1,630; in its 8K by 18 configuration, $1,325.

Dataram is located at Princeton-Hightstown Road, Cranbury, N.J. 08512.



Don't buy a 32-bit computer.

Buy a 32-bit computer company!

Buy a 32-bit computer from some computer companies, you get a computer and a handshake. Ten days later, you get an invoice. Sometimes you don't even get the handshake.

Buy a 32-bit Interdata computer system from Perkin-Elmer and you get the most advanced 32-bit computer in the world, the hottest 32-bit software in the industry, and an entire company dedicated to one purpose: making you successful. (You also get an invoice.)

There's no substitute for experience.

When you buy an Interdata computer, you buy the company that pioneered 32-bit minicomputers. We've installed plenty of 32-bit minicomputer systems since 1973. And the experience we've gained, experience our competitors simply don't have, can mean the difference between having your system on-line in a few hours. Or waiting for weeks or months.

Systems that solve problems.

And speaking of systems, we build systems for solving problems. Big problems. Small problems. Big systems. Small systems. For science. Industry. Business. Government.

In every system there is one common element. All the pieces can literally be plugged together and running jobs the day they arrive, which is a real advantage and a timesaver.

Systems with powerhouse software.

The biggest advantage we have, however, is our software. Software, incidentally, written especially for 32-bit machines, not made over 16-bit stuff.

We have gangbusters software. A full-blown transaction oriented operating system. File management. ITC for transaction processing. Communications packages for distributed processing. And high level languages including FORTRAN, COBOL, and BASIC. All designed to make your

Mini Provides the Wind

Yacht Club Sails Into Smooth Financial Waters

By Ann Dooley
CW Staff

SAN FRANCISCO — A minicomputer system that is used to handle all the general ledger work and membership information is encountering smooth sailing at the St. Francis Yacht Club here.

The club uses a Basic/Four Corp. Model 400 system, which it purchased two years ago after a fire destroyed the accounting machines used to balance the accounts of its 1,865 members.

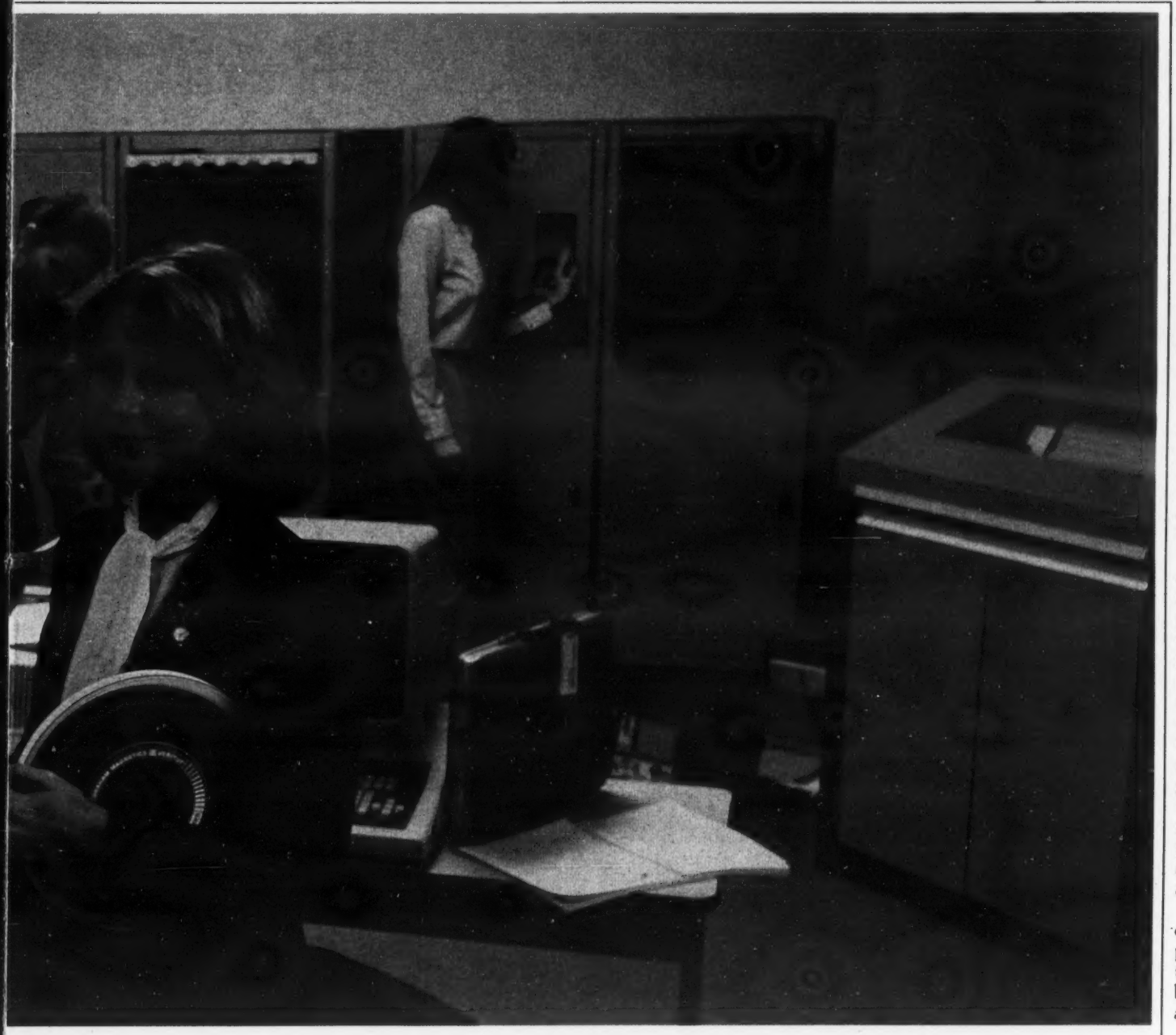
St. Francis contracted with Interactive Computer Systems (ICS) of Costa Mesa, Calif., a software company, to reconstruct the club's membership files and handle all the accounts using the Model 400.

While ICS was compiling the lost records, Ernest Friez Jr., club manager, looked at several other systems, but finally decided to stay with the Basic/Four system. He chose the Model 400 primarily because its vendor offered an existing software package for yacht clubs, he recalled.

Since St. Francis installed the system, the time to process accounts receivable has been cut by two-thirds and the time to process the payroll for 50 employees has been reduced by half, Friez said.

The system handles a general ledger program including all the usual accounting functions, according to club accountant Trudy Schmidt. The yacht club is planning to add inventory control of food and beverages, as well as handicap statistics for the sailboats and other statistical work related to the club's regattas.

The club is also planning to add a second terminal to ease the workload on the yacht club's existing input unit, which is in constant use, according to Schmidt. In addition to the 24K-byte CPU, the system incorporates a 10M byte disk drive, a CRT terminal and a medium-speed matrix printer to generate hard copy.



Data Bases

The system contains membership information including children's names, boat numbers, purchase history and other pertinent member data. Employee records stored in the system include payroll data, date hired, home address and other statistics, Schmidt said.

The system selects checks to be paid; performs payroll; generates trial balances, financial statements and budget statements; and prints mailing labels, she noted.

Once a member's charge and cast transactions are recorded in the register and checked to make sure they balance correctly, the totals are put on a control sheet and entered by batch control into the system.

The information entered includes the bill number, dining number and the number of persons served, as well as other necessary billing information.

The system is programmed to break down billing totals by the type of expenditure (lunch, dinner or special event charges), add sales tax, include guest charges and update the total posted for each member's account. It provides a complete batch total automatically and updates the general ledger account.

In addition, the system updates all paid cash sales, produces a report indicating the balance owed by the member and updates all members' accounts.

The system also produces a summary indicating the number of sales, the average meal sale and a complete month-to-date sale total, Schmidt said.

Further, the system is programmed to select which checks to pay by due date, discount date or cycle time and runs a selection report to verify the choices, Schmidt said.

programming easier.

But, most important, when you buy a 32-bit system from our Interdata Division, you get service. The old-fashioned kind. The kind where we go out of our way to make sure you're successful.

Good old-fashioned service.

We'll be with you when you configure your system. While it's being built. When it's delivered and installed. While we train your people. And for years thereafter.

If you need customer service, one toll-free call reaches us. Days. Nights. Weekends. We'll be there.

Think about that. And, instead of just buying a 32-bit computer, buy a 32-bit computer company. Perkin-Elmer.

For more information, write Perkin-Elmer Data Systems Sales and Service Division, 106 Apple Street, Tinton Falls, New Jersey 07724 or telephone toll-free (800) 631-2154.

Here is my business card. Tell me more about computers in ☐ business ☐ scientific ☐ simulation ☐ OEM applications.

PERKIN-ELMER
Data Systems

Panel Explores Novice User's Software Quest

(Continued from Page 57)
sacrifices here and there in an attempt to secure an abode that meets most of their major requirements. Later, when the buyers occupy their new house, they can make minor additions or improvements as they see fit.

The same principle applies to most prospective buyers of small business applications software, according to Muhle. Few users develop a package from scratch. Rather, they evaluate the range of software already available in their respective industries and then choose a product, he noted.

If necessary, they later modify the package to make it more nearly suit the applications requirements peculiar to their individual companies.

If the Suit Fits . . .

Brill responded to Muhle's metaphor with an analogy of his own. Most clothing store patrons, he said, can buy an off-the-rack suit and obtain a decent fit with only minor hemming and stitching.

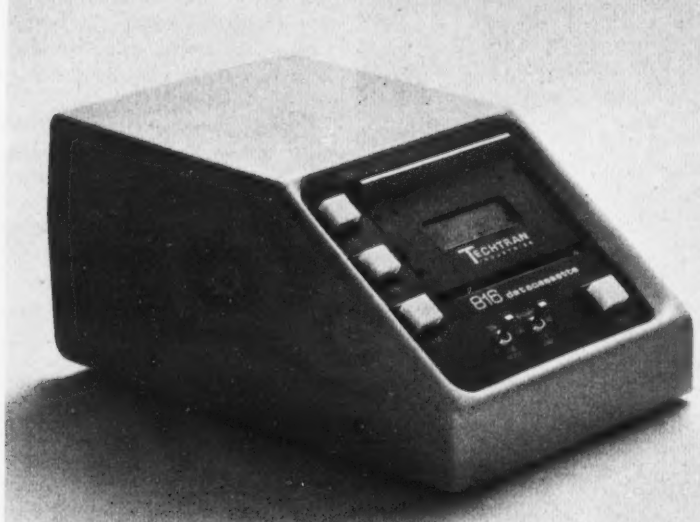
Some people, however, have such unusual physical attributes that no amount of alteration to an off-the-rack suit will accommodate their needs. Such buyers require custom-tailored clothing just as some businesses demand custom-written applications software, he explained.

Brill conceded that canned software usually costs less and proves quicker and easier to implement than its custom-developed counterpart. "But that advantage applies only if the software fits," he said.

Software development, Brill continued, typically consists of three major phases: system design, programming and installation. With a customized package, design usually occupies about 25% of the total development time; programming, about 55%; and installation, the remaining 20%.

With a packaged system, by contrast, users can typically cut their design time by 10%; programming, by 30%; and implementation, by 5%, Brill said. "The quicker development times associated with canned applications software, however, will be somewhat mitigated by the vendors' 90- to 120-day delivery lead times for hardware," he warned.

in RS-232 digital recorders
Techtran does it best!



New Datacassette Series
$950. and up
. . . singles & duals available

- Now ANSI/ECMA compatible and TI 733, NCR . . .
- New character string search
- New powerful text editor
- AC & battery power
- Microprocessor controlled

New Mini disc Series
Only $1395.
. . . much lower in OEM quantities

- Over 200K capacity per disc
- Hi speed random file access
- File directory on each disc automatically recorded/updated
- Self-initialized recording preformatted discs not required
- Microprocessor is resident program no operator loading

Nobody does it better

TECHTRAN INDUSTRIES, INC
200 Commerce Drive, Rochester, New York 14623
Tel: (716) 334-9640 TWX: 510-253-3246
Los Angeles Tel: (213) 349-0775
Canada (416) 241-5213 • (514) 844-1079 • (403) 269-7705

Send for details today

See us at NCC, Booth 2751

Wirewrap Boards Fit IBM Series/1

ORANGE, Calif. — Custom interface design requirements for the IBM Series/1 are reportedly facilitated by two wirewrap boards introduced here recently by MDB Systems, Inc.

Models MBI-49-WW72 and -WW64 provide 72 20-pin or 64 16-pin integrated circuit (IC) positions, and users can develop various other IC size combinations, MBD officials said.

Both boards include pins in the user wirewrap portion and come with pads for discrete components, the spokesman added. Available with two 40-pin ribbon-cable edge connectors, the products accommodate any .3-, .4- or .6 center dual in-line packages, MDB explained.

The Series/1 boards are said to occupy one chassis slot in an IBM CPU and come with power and ground that are prewired to each standard socket position.

Both boards cost $495 from MDB systems at 1995 N. Batavia St., Orange, Calif. 92665.

'It Wants an Application for Mensa!'

3340/3344
DISK DRIVES
Wanted to purchase or trade.
COMDISCO
312-698-3000

Features Programmable I/O

National Semi Has Rack-Mounted MPU

SANTA CLARA, Calif. — National Semiconductor Corp. has introduced a rack-mounted 8-bit microcomputer that reportedly incorporates programmable serial and parallel I/O, complete busing and three expansion board slots.

The RMC 80/10 has six general-purpose registers, an accumulator, a 16-bit program counter and a 16-bit stack pointer, according to a spokesman. The registers can be used singly or in pairs and the program counter allows direct addressing of 64K bytes of memory.

The stack pointer permits storage and recall of register contents while servicing interrupts and subroutines, the firm added.

The unit is based on a BLC 80/10 MPU with 1K of on-board random-access memory (RAM) and four sockets for up to 4K bytes of programmable read-only memory (Prom). Two of the Prom sockets can be used for an optional system monitor for loading, debugging and executing programs.

The monitor permits reading and punching of paper tape, display and change of memory register contents and execution of program segments.

All RAM and Prom operations are performed at the 1.95 microsec maximum processor speed, the spokesman said.

Programmable Communications

A programmable communications interface can be added to the unit to provide either synchronous or asynchronous serial I/O with jumper-selectable rates from 110 bit/sec to 19.2 kbit/sec as 20mA current-loop or RS-232C signals.

The system software selects the mode and inserts data, control characters and parity bits, according to the vendor.

In addition, 48 lines can be software- or firmware-programmed to any unidirectional or bidirectional I/O configuration, the spokesman said. Ten sockets on the board permit the user to select proper terminators and drivers for each application.

The 80/10 memory is expandable to 64K bytes; an optional combination board supplies an additional 48 programmable parallel lines and an additional serial RS-232C communications interface.

National Semi RMC 80/10

Input power for the unit is transformer tap-selectable for 100V, 115V, 200V and 230V at 47 Hz to 63 Hz with a total power consumption of 36.2W without expansion board options, National Semi said.

In single quantitites, the RMC 80/10 is priced at $1,345. National Semi is at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Zilog Development System Built for Z80

CUPERTINO, Calif. — Zilog, Inc. has introduced the ZDS-1/40 development system, a stand-alone hardware and software design tool to support the development of Z80- and Z80A-based microprocessor systems.

The ZDS-1/40 is said to achieve real-time emulation by using two microprocessor circuits — a Z80A MPU inserted into the prototype system and a second Z80 MPU inside the development system. This two-chip method reduces the problems inherent with connecting the user's system to a development system and allows emulation to clock frequencies of 4 MHz a spokesman said.

Zilog is offering the 4 MHz emulator two ways: with the ZDS-1/40 development system or as a factory-installed Zilog Real-Time Emulator option (ZRTE) to upgrade users' existing ZDS/U development systems to accommodate 4 MHz components.

Hardware features the ZRTE include a thick-film hybrid version of the Z80A MPU circuit with the same timing and characteristics of the Z80A MPU. Through the use of a 6-ft flat cable, the ZRTE inserts directly into the user's system, enhancing noise immunity, the spokesman claimed.

Other ZRTE features reportedly include memory mapping and protection in 1K-byte segments; user memory refresh, even when emulation is suspended; verification of user clock integrity; detection of memory access to nonexistent or write-protected blocks; and disk-based software.

System Features

A standard ZDS-1/40 development system includes 32K bytes of main memory, with a capacity of up to 65K bytes on a single board, allowing more room for additional I/O options.

In addition, according to Zilog, the ZDS-1/40 offers users:

- The RIO operating system with relocating assembler, linker, text editor and logical file structure.
- Floppy disk drives, each providing storage of up to 300,000 bytes on removable diskette.
- A programmable breakpoint module to permit the monitoring and testing of specific address, data and control bus states to stop program execution or to create a scope sync.
- Programmable real-time storage module to allow the recording of address, data and control bus lines for selected operations (memory read, memory write, instruction fetch, I/O read and I/O write).
- I/O Ports. Users can access all I/O ports when user mode and user clock is selected.

The disk-resident software for the emulator is a command package for effecting real-time, in-circuit emulation for the user's prototype system, the spokesman said.

The software package provides both user initialization commands and user debug commands. With the user initialization commands, the user can set the mode of emulation (interrupt mode and write-protect break) and display and edit the memory map.

The user debug commands allow the user to set and display user memory; set and display the current state of the emulator; get image files from disk and load them into user memory; save user memory on to disk as image files; start and monitor execution of user programs; input from or output to an I/O port; and display and edit the emulation status, Zilog said.

The ZDS-1/40 costs $11,690 and the ZRTE option costs $2,750. Detailed specifications and applications information are available from Ron DeJong at Zilog, 10460 Bubb Road, Cupertino, Calif. 95014.

Objective Design Unveils Trio: PCG, Cardframe, 'Star Wars'

TALLAHASSEE, Fla. — Objective Design, Inc. has extended its line with a trio of products: a programmable character generator (PCG) for Z80-based systems, an S-100 cardframe construction kit and a "Star Wars" simulation game program.

The PCG can be used with video boards incorporating Motorola Semiconductor Products, Inc. 9 by 7 matrix generators. The card is made operational in the user's system by removing the character generator read-only memory (ROM) from the video board, plugging it into the socket on the PCG and then running a 24-pin connector from the PCG to the empty character generator socket, a spokesman explained.

Users can create individual characters, store them in on-board random access memory (RAM) and access the characters directly from the keyboard, he noted.

The S-100 construction kit comes assembled into a cardframe with room for 22 cards, the spokesman said. The kit contains front and rear prepunched panels, support bars, structural bars, motherboard supports, a set of 10 card guides and a power supply.

The game program is an adaptation of the "Star Wars" movie battle against the Death Star. Under player control, ships move in three dimensions to simulate space flight, the firm claimed.

The game, which requires Objective's character generator for operation, is written in 14K of 8080 Assembly language. The program code is offered on tape cassettes.

The PCG is priced at $165.95 as a kit and $215.95 assembled; the cardframe kit costs $154.50 with a power supply and $89.50 alone. The game program, with rules and instructions, costs $7.50.

Objective Design can be reached at P.O. Box 20325, Tallahassee, Fla. 32304.

Exorcisor Users Get Expander Board

CANTON, Mass. — Datel Systems, Inc. has a 32-channel analog-to-digital (A/D) multiplexer expander board for users of Motorola Semiconductor Products, Inc. M6800 Exorcisor systems.

The ST-6800ADX32S board has an analog signal performance which includes a 1 msec settling time for the multiplexers and channel-to-channel throughput time of 20 msec, the firm stated.

Inputs are protected for continuous 35V inputs and break-before-make switching offers 1,000M ohm channel-to-channel and input impedance, a spokesman added.

On-board addressing permits a channel expansion of up to 128 channels with additional boards, he said.

The board is priced at $295 from Datel at 1020 Turnpike St., Canton, Mass. 02021.

S-100 Bus-Compatible

Comptronics MPUs Based on F-8

WOODLAND HILLS, Calif. — Comptronics, Inc. has unveiled two products designed for hobbyist applications and based on Fairchild Camera and Instrument Corp.'s F-8 microcomputers.

The F-8S100 is an F-8 MPU board that is compatible with the S-100 bus and comes with a 3850 MPU and 3853 static memory interface, a spokesman said.

The unit provides sockets for 2K of erasable programmable read-only memory (Eprom), two processor I/O slots and connections for six I/O ports.

The board has 64 bytes of scratch-pad random-access memory (RAM) and a fully buffered data bus, the firm noted.

The KD80 is an F-8 microcomputer with keyboard and a six-digit display. It has an audio interface and speaker compatible with the on-board KD-Bug (3856) music routine, 2K of expandable RAM and 1K of Eprom with four additional 2708 sockets, the spokesman for the firm added.

The F-8S100 sells for $239 as a kit or $279 assembled. The KD80 costs $375 as a kit and $425 assembled. Comptronics is located at 19824 Ventura Blvd., Woodland Hills, Calif. 91364.

Hybrid D/A Converters Need No Adjustments

BEDFORD, Mass. — Hybrid Systems Corp. has a series of digital-to-analog (D/A) converters that it said are preadjusted and available in four voltage range outputs.

The DAC336-8 line features ladder networking, output amplifiers and input storage registers, the firm said. The IC design of each converter is pretrimmed to approximately .05% with a 4 msec least-sigificant bit (LSB) settling time and a .5 LSB maximum linearity.

The units draw 200 mW of power, operate in temperatures from -55°C to 125°C and are contained in 16-pin glass dual in-line packages (DIP), a spokesman for the firm noted.

Two Models

Two models are offered, the DAC336-8 for commercial/-industrial uses and the DAC336B-8, packaged in a metal hermetic DIP for Class B processing.

The units are priced at $24 and $44, respectively, from the firm at Crosby Drive, Bedford Research Park, Bedford, Mass. 01730.

Prices Cut On Intel RAMs

SANTA CLARA, Calif. — Intel Corp. has reduced OEM prices for its 2115A/-2125A family of 1K-bit static random-access memories (RAM) by as much as 35%.

The price cuts, which became effective April 7, reduce the chip prices to as low as $3.95 each.

It is not known if the price reduction will affect single-quantity prices from independent retailers.

Intel's 2115A/2125A RAMs are used as equal-speed, lower power replacements for bipolar RAMs, a spokesman explained from 3065 Bowers Ave., Santa Clara, Calif. 95051.

Motorola M6800 Users Gain Basic Compiler

DES MOINES, Iowa — Microware Systems Corp. has introduced an applications-oriented language compiler compatible with Motorola Semiconductor Products, Inc. M6800 microcomputers.

A/Basic has an extended syntax including string, logical, real-time and interrupt-processing capabilities, Microware said. The output of the two-pass compiler is actual machine language that can be loaded into read-only memory (ROM) or random-access memory (RAM) and run without any runtime subroutine package, the firm claimed.

The compiler requires at least 8K of RAM and either an audiocassette unit or floppy disk. Its $50 price includes a line-oriented text editor, RT/-Edit, that is written in A/Basic and can be recompiled to user specifications.

Microware can be reached at P.O. Box 954, Des Moines, Iowa 50304.

'Posis' Extends MPU Use

INDIANAPOLIS — The Data Group, Inc. has an interactive software program which is said to allow 8080/Z80-based microcomputers to be used as point-of-sale and inventory control systems.

The Posis system can store up to 9,000 inventory items and can generate a variety of management reports based on a business' inventory transactions, a spokesman stated.

Features include identification and password security checks at key points in the program and an audit trail summarization of each transaction, he added.

Posis converses with the user in English and provides step-by-step guidance through each transactional procedure, the firm noted.

The program is priced at $750 from Data Group 5947 E. 82nd St., Indianapolis, Ind. 46250.

'Now That's What I Call a Floppy Disk!'

S **STANDARD** — Established unit of measurement, or reference instrument or component, suitable for use in calibration of other instruments. Basic standards are those possessed or laid down by national laboratories or institutes, e.g., BSI, NPL, Ansi, others.

STRING — 1. In a list of items, a group of items that are already in sequence according to a rule. 2. A set of records which is in ascending or descending sequence according to a key contained in the records.

SUBROUTINE — 1. In computer technology, the portion of a routine that causes a computer to carry out a well-defined mathematical or logical operation. 2. Usually called a closed subroutine. One to which control may be transferred from a master routine and returned to the master routine at the conclusion of the subroutine. 3. Refers to either part of a master program or routine that may be "jumped" or "branched" to or to an independent program in itself but usually of smaller size or importance. 4. A subroutine is a series of instructions to perform a specific task for many other routines. It is distinguishable from a main routine in that it requires as one of its parameters a location specifying where to return to the main program after its function has been accomplished.

SUBSCRIPT — Integer numerals or symbols attached to a quantity to indicate its location in an array such as a matrix below a set name to identify a particular element or elements of that set. 2. An indexing notation; elements of that set.

SYMBOLIC CODE — Refers to a specific code designed to express programs in source language; i.e., by referring to storage locations and machine operations by symbolic names and addresses which are independent of their hardware-determined names and addresses.

T **TELETYPE** — Trademark of the Teletype Corp. Usually refers to a series of different types of teleprinter equipment such as transmitters, tape punches, reperforators and page printers utilized for communication systems.

THROUGHPUT — 1. Relates to the speed with which problems, programs or segments are performed. Throughput can vary from application as well as from one piece of equipment to another, although they are the same brand and even model. 2. The total useful information processed or communicated during a specified time period.

TIME-DIVISION MULTIPLEX (TDM) — A device or process that transmits two or more signals over a common path by using successive time intervals for different signals.

LEARNER'S LEXICON

From Microcomputer Dictionary & Guide by C. J. Sippl and D. A. Kidd. Used with permission of Matrix Publishers, Inc., 207 Kenyon Road, Champagne, Ill. 61820.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Micro Bytes

Micro Networks Offers Converters

WORCESTER, Mass. — An analog-to-digital (A/D) converter from the Micro Networks Corp. features five user-selectable analog input ranges and the choice of an internal or external clock.

The MNADC85 has an 8 microsec conversion time and is available in both 10- and 12-bit linearities, a spokesman said. The unit was designed to operate over a temperature range of -25°C to 85°C.

The converter is contained within a 32-pin, hermetic dual-in-line package (DIP) and sells for $138 in 100-unit quantities from the company at 324 Clark St., Worcester, Mass. 01606.

Tool Removes DIP Chips

POMONA, Calif. — A hobbyist tool from the Pomona Electronics Division of International Telephone and Telegraph Corp. was designed to remove 14- and 16-pin dual in-line package (DIP) integrated circuit chips.

The Model 4386 is fabricated from a glass-filled nylon material that will withstand 240°C at a relative humidity of 40%, a spokesman claimed.

The tool is priced at $1.85 from the company at 1500 E. Ninth St., Pomona, Calif. 91766.

Brochure Available

DERBY, Conn. — Descriptions and specifications of four circuit design test instruments are outlined in a brochure offered by E&L Instruments, Inc.

The brochure describes E&L's Adam modular breadboarding system, and is free from E&L at 61 First St., Derby, Conn. 06418

INTERNAL REVENUE

problems got you down? If your taxes aren't finished why not let your computer do it for you. Volume VIII has just been released! It contains a SUPER 1040 Tax program that fills out Schedule A and handles inputs from supplemental schedules B, C, D and F. It has all the new tax revisions in it and is complete and ready to run. In addition there are a number of other programs included on: interests, mortgages, installments and more. Volume VIII is only $19.95 plus $1.50 for UPS delivery. Hard to believe?? Our Volume VI which contains our Mini-Ledger is only $49.95 and Volume VII which contains our powerful Word Processor and other programs is only $39.95. Bankcards and COD orders call 800-327-6543. For information only call 305-361-1153. Mail orders please remit to:

SCIENTIFIC RESEARCH
220-W Knollwood
Key Biscayne, FL 33149

Symposium to Discuss Benefits of Micros

GAITHERSBURG, Md. — The current and future benefits of microcomputer technology will be discussed at a symposium on "Microcomputer-Based Instrumentation" that will be held at the National Bureau of Standards (NBS) here June 12-13.

The sessions will focus on four major areas, each highlighted by an overview presentation, and will cover microcomputer technology, applications to scientific instrumentation, microcomputer interface standards and applications to industrial process control, an NBS spokesman said.

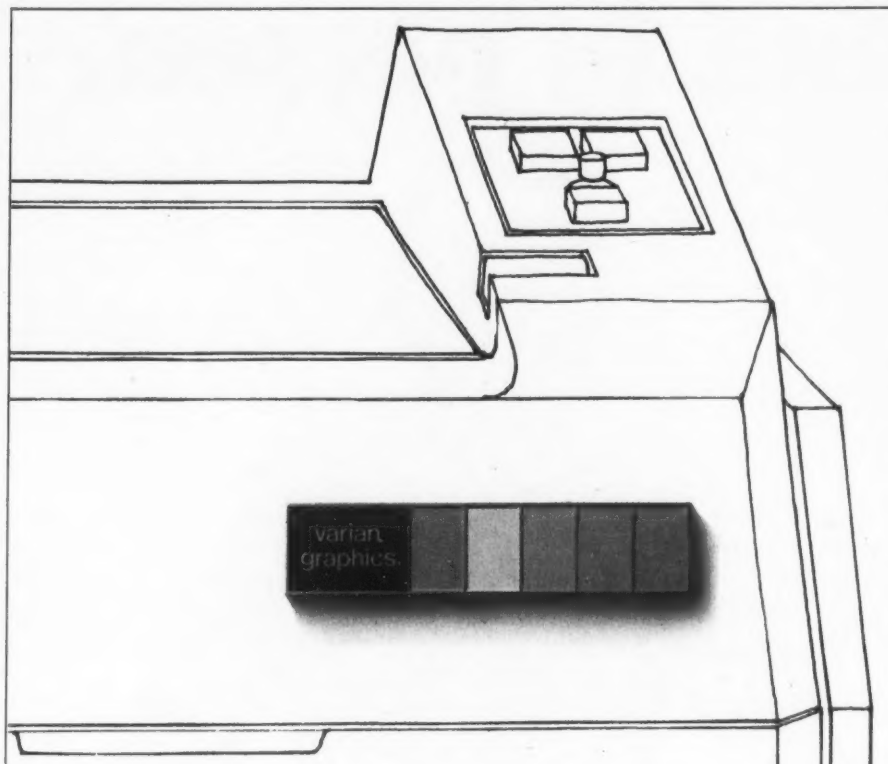
The symposium, jointly sponsored by NBS, the Institute of Electrical and Electronics Engineers (IEEE) Computer Society and the IEEE's Instrumentation and Measurement Group, will mark the opening of a series on "Challenges in Science and Technology."

The symposium series is intended to encourage a cross-fertilization of ideas from many disciplines, the spokesman said. Participating scientists with diverse backgrounds will assess current trends and future needs.

Major papers at the June symposium will discuss:

- Microcomputers for biomedical and clinical applications.
- Microprocessor-based, satellite-controlled clocks.
- Fault tolerance in distributed architectures.
- Microcomputers in the linear world.
- Automation of analytical instrumentation.

Information on sessions scheduling and registration can be obtained from Bradford M. Smith, Room A130 Technology, NBS, Washington, D.C. 20234.



It's true that one printer/plotter looks pretty much like another.

But do you know what distinguishing mark appeared on the first one?

In 1967 Varian's nameplate went on the world's first electrostatic printer/plotter. And now, a decade later, it's still at the front with probably the most accurate and reliable unit around.

Several exclusive features have kept us there: Like an automatic concentrate-add package for consistent black and white. Like 1800 lines per minute printing and four inches per second plotting on an 11 inch machine. And 128 characters (upper and lower case, plus scientific symbols) in it's hardware character generator. Standard, not optional.

The others may look a little like us. But we're the only one that's pure Varian: Solid, dependable, here to stay.

Varian

P.S. We also have some new things to show you at NCC!

I'd like to know more from the ones who started it, so

☐ Please send "Printer/Plotter Considerations", an overview of the current state of electrostatics.

☐ Please have a sales engineer call to arrange for an appointment.

☐ Please keep me on your list for future updates and mailings.

Name _____

Address _____

City/State/Zip _____

_____

Phone _____

Varian Graphics Division
611 Hansen Way
Palo Alto, CA 94303
(415) 494-3004

You won't believe our Ballistic™ Printer until you see one in print.

And in person.

Unless you've been in hiding, you've probably heard about LSI's family of Ballistic Printers. Built with the same proven dependability of the Dumb Terminal and his Smarter Brothers.

Our latest matrix printer, the 200A, comes with standard features like a Space and Blank Character Compression Buffer. Tabbing over Blank Spaces ability. Half Duplex or Full Duplex Operation. And a fully buffered input, optionally expandable to 1024 characters. Not to mention its microprocessor versatility, and firmware flexibility.

To top it off, you can choose from options like Serial, RS232, Parallel, and Current Loop interfaces. Polling. X-ON, X-OFF. And elongated character capability with a choice of either 10, 12 or 16.5 Pitch.

The Printer's reliability lies in the simplicity of its patented Ballistic head. Which ballistically propels the matrix wires to assure longer head life. Eliminating tube clogging with inks, dust, and paper fibers. Even wire tip wear is substantially reduced.

The Ballistic Printer uses a five-start lead screw and servo to print bi-directionally at 180 cps. Direct, simple, positive. And very accurate.

But, seeing is believing. So, if you'd like to be amazed by our Ballistic Printer in person, write or call us toll free (800) 854-3805. Just ask for Tom Hudspeth.

If you haven't seen the Ballistic Printer in action, you haven't seen ballistic printing.

Ballistic™ Printer. Tougher in the long run.

LEAR SIEGLER, INC.
ELECTRONIC INSTRUMENTATION DIVISION
DATA PRODUCTS

Lear Siegler, Inc./E.I.D., Data Products, 714 Brookhurst St., Anaheim, CA 92803; (800) 854-3805. In California (714) 774-1010.

Mini Maker, COI Square Off

Fraud Ruled in 1968 DEC Tape Patent

By Marcia Blumenthal
CW Staff

LANHAM, Md. — A recent finding of the U.S. Patent and Trademark Office that Digital Equipment Corp. fraudulently obtained a patent for bidirectional tape in 1968 is fueling the fire of counter suits between the billion-dollar Goliath and the opposing David, Computer Operations, Inc. (COI) here.

The combat started in 1974, when DEC advised COI it was infringing on DEC's 1968 patent for a bidirectional tape coding system and suggested COI pay royalties.

Ignoring that suggestion, COI filed a suit claiming DEC's patent was invalid because the technology was in public domain and alleging DEC had obtained the patent fraudulently. In particular, COI accused DEC of not disclosing prior technology and of offering the product for sale more than a year before applying for the patent, as required by patent law.

DEC countered with a patent infringement suit against COI, a publicly held firm which manufactures a line of tape drives. The product in question in the suit currently represents about 40% of COI's $1.4 million annual revenues, the firm said.

In commenting on the patent office ruling, a spokesman for DEC stated, "We are very disturbed about the glib use of the word 'fraud,' which suggests to most people malicious intent to deceive." The company claims the issues involved are of a technical nature, not moral.

In fact, after COI filed its suit, DEC applied for a reissue of the patent in order to reaffirm the validity of the original patent, DEC noted.

The patent office's refusal, three weeks ago, to reissue the patent upheld the accusations of fraud made by COI in its lawsuit. However, findings of the patent office are advisory, not legal.

Now the cases must be settled in the courts. Stephen E. Silverman, president of COI, is buoyant about the patent office's ruling, viewing it as an omen of an ultimately favorable court decision for his company.

Disclosure Factor

The most serious allegation at issue centers around the "disclosure of prior art" requirement in applying for a patent. This requirement stipulates the applicant must describe all inventions leading up to the present discovery.

DEC asserts that the prior art section of its original application did contain a description of Linc tape, developed at MIT, which was similar to the currently marketed Dectape but lacked the essential bidirectional coding feature which is the crux of the DEC invention.

Countering DEC's claim, COI's Silverman pointed to pretrial discovery actions (part of the pending lawsuits) during which DEC, under oath, stated Linc tape was the most relevant prior technology. However, Silverman contended that DEC's original patent application and the subsequent reissue application did not mention Linc tape in the prior art section.

In addition, according to COI, the people working on Linc tape at MIT later joined the staff of DEC, convincing management to develop Dectape. The engineer who invented Dectape is Thomas Stockebrand. He and Kenneth H. Olsen, president of DEC, are named in the patent office's ruling as participants in the fraud.

Another major issue is that DEC's patent was invalidly granted because, contrary to patent law, DEC applied for the patent more than one year after offering the product for sale. Therefore, Silverman charged, COI is really not infringing on the DEC patent because DEC, by failing to apply for the patent within the appropriate time frame, let the technology pass to the public domain.

Not so, DEC has responded, explaining that patent law requires the product to be in actual commercial form within one year prior to the patent application. The product DEC delivered to a customer in late 1963 was still in the experimental stage and was not fully operational until early 1964, leaving plenty of leeway to apply for the patent, the firm said. DEC applied for the patent in November 1964.

The case is still in the pretrial stages, and the trial is not scheduled to start for about three years.

Debate on Transborder Privacy Producing Charged Atmosphere

By G. Russell Pipe
Special to CW

BRUSSELS, Belgium — The dust has settled since the recent European Parliament hearing and Transnational Data Regulation Conference here, but a more charged atmosphere between data processors and government officials has emerged.

Such "open forums" as the parliamentary subcommittee and Online Conference saw a lot more candor and a certain amount of outrage than emerged at last fall's Organization for Economic Cooperation and Development (OECD). The assessment of the situation, however, seems increasingly pessimistic.

One DP executive summed up the trend by saying, "We definitely face a heavy regulatory environment." Many businessmen have concluded:

- Privacy, economic protectionism, national sovereignty and telecommunications policy are becoming closely related.
- Taxation of cross-border commercial data traffic could become a significant issue to multinationals.
- Governments and international bodies are setting policies without any meaningful business representations, nor are their products and services adequately understood.

The European Parliament is generally committed to a binding directive on data protec-

Analysis

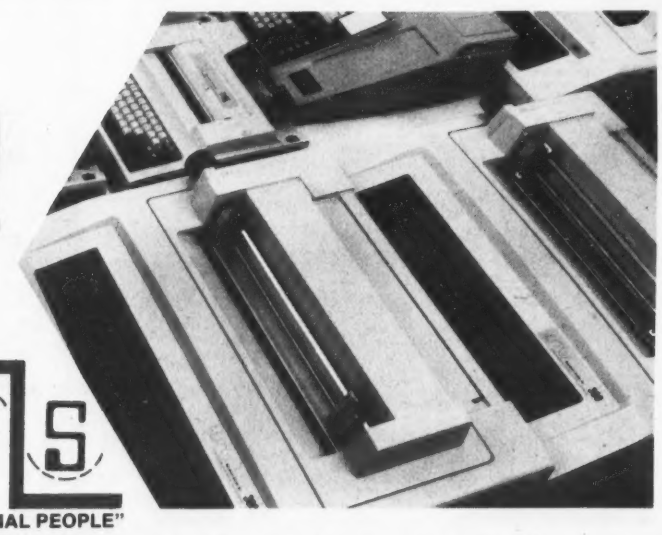
tion, so its hearing sought evidence on what such a law for the European Economic Community (EEC) should contain. Extending privacy rights to companies is currently a hot topic in Europe, since such a provision was dropped from the recently approved French privacy law.

An IBM Europe spokesman contended that such a provision would give government agencies "a right to control the flow of much commercial information even when there are no implications for the privacy rights of individuals." But France's Louis Joinet indicated his country feels its initial

(Continued on Page 68)

DEC LS120'S, LA180'S, LA36'S

IN STOCK!!!



Single Source—Coast to Coast ☐ Fast Delivery—Nationwide
National Service—Our Own Experts ☐ Low Cost—Big Savings

DAS STOCKS DEC's entire data terminal line, including all popular options. We also SERVICE what we sell, nationwide. Other dealers PROMISE a lot, DAS delivers any quantity at LOW PRICES. We also stock TI's 745, 743, 765, 763; Diablo's 1620 and 1641; Lear Seigler's ADM 1, 2, 3; and the Teletype 43. Compare for PRODUCT, PRICE, DELIVERY and SERVICE. You'll come to **"THE DATA TERMINAL PEOPLE."**

Call your local district office, or toll free numbers: East 800-631-9604 West 800-227-4406

DAS
"THE DATA TERMINAL PEOPLE"

Data Access Systems, Inc.

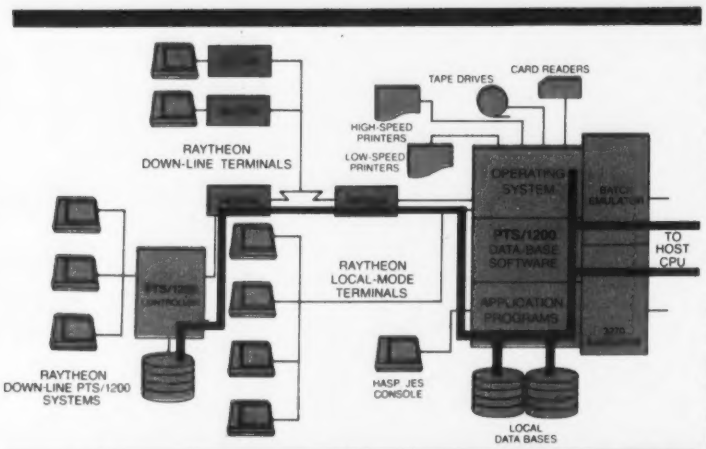
Corporate offices:
100 Route 46, Mountain Lakes, N.J. 07047 • (201) 335-3322 or Toll Free (800) 631-9604

District offices:
Boston — (617) 933-8822
Washington, D.C. Area — (703) 525-2923
Phila. So. Jersey — (609) 854-0070
Chicago — (312) 298-0777
Los Angeles — (213) 538-4100
San Francisco — (415) 391-5535

The Raytheon Checklist.
A distributed processing user's best friend.

The term distributed processing is new enough that many people, both users and manufacturers, mean many different things when they talk about it.

Rather than try to add another definition to the many now existing, Raytheon Data Systems has prepared this comparative checklist of the major functions that might normally be considered attributes of any distributed processing system.



Shown above is a typical schematic of a PTS/1200 distributed processing system with a hierarchy of local data bases, multiple terminals in multiple applications, all linked by one or more protocols to a central mainframe.

Regardless of the distributed processing system you eventually select, there are a number of capabilities you will want that system to possess. Obviously, the more features the system has, the greater its capacity to do all the work you have planned now—or might need tomorrow.

Our checklist itemizes many of the most important features you should consider. They are not the only features, but we think they are the most important.

And—to make the point that Raytheon's PTS/1200 MARK·I and MARK·II systems are extraordinarily powerful distributed processing systems—we've taken the liberty of itemizing their capabilities in each of the columns shown. Do that with other vendors' equipment, and we think you'll choose Raytheon.

Then check prices. The MARK·I is lowest.

After you've looked at the variety of products on the market, you'll also want to see what each costs.

We can tell you about Raytheon's pricing. The PTS/1200 MARK·I is the lowest. By low, we mean up to 30 per cent below the most popular alternative models. The PTS/1200 MARK·II costs a little more, but is more than twice as powerful as the MARK·I. You won't be able to compare its cost directly with other equipment, because no other equipment can come close to matching its performance.

Solving the installation and productivity problems that these users encounter takes patience, skill and the commitment of an experienced vendor. It takes going beyond a standard product, and finding customized solutions, and often products, to meet a user's requirement.

Most of all, it takes doing it. Over and over and over again. Raytheon has done it over and over and over again.

Fast, easy installation and growth is vital.

Not shown in the checklist is another vital aspect of distributed processing systems—immediacy of installation and ease of expansion. The Raytheon PTS/1200 MARK·I can be installed in less than a day, with no change to host hardware, or systems or applications software: You become productive right away. And when you want to grow, you simply add capacity—within a single system, or by adding additional systems or devices. Every PTS/1200 is compatible with every other—and with your host mainframe system and protocols in almost every case.

Look hard at experience too.

Beyond the hardware, the price and the easy compatibility, there is the experience factor. The vendor with experience can save the user without it a lot of grief.

Raytheon is the world's largest non-mainframe supplier of intelligent terminals and distributed processing systems. Some of our customers use more than 2,000 Raytheon terminals in data networks located at more than 300 locations either domestically or around the world. Many others have one or several PTS/1200 distributed processing systems at work in remote locations, linked on-line to a central mainframe.

A typical four-station MARK·I system with a 64K-byte controller, 10 MB disk, and one 165cps printer leases for $850 per month, including all software and maintenance.

The 54-Point Checklist

Feature	Typical Configuration	Importance of Feature	Product Capabilities: PTS/1200	Brand X	Brand Y	Brand Z
INTELLIGENCE	✓ Dependent totally on host processor ✓ Stand-alone (non-shareable) intelligence in each station ✓ Small-cluster (shared by 1-8 stations) ✓ Large-cluster (shared by 1-24 or more stations)	Intelligence is based upon the amount of available programmable memory a system possesses. Its purpose is to facilitate local application development and execution. The larger the available memory, the better the applications freedom.	N/A All resources shareable by all stations 64K to 128K bytes 64K to 128K bytes			
CONTROLLER	✓ Word size ✓ Number of operator stations per controller ✓ Number of peripheral attachments per controller ✓ Availability of high level languages ✓ Ability to perform multi-tasking	The controller is the central processor of a distributed system. Its power in terms of word size, attachment capacities, programmability and ability to perform multiple tasks concurrently is the key limiting factor in its ultimate performance.	16-bit 1-8 stations, or 1-24 stations 1-4 peripherals, or 1-20 peripherals Yes: MACROL, COBOL in the future Yes Up to 32 tasks concurrently on one controller			
TERMINALS	✓ Variety of screen sizes ✓ Variety of keyboard options ✓ Availability of user-definable function keys ✓ Ability to provide operator prompting ✓ Ability to attach remote terminals on phone line	The terminal is the point of operator interface and should be capable of being comfortable to use, easy to use, and easily matched to one or many different applications through customizing.	960 or 1920 3270 typewriter, data entry 16 program function keys, plus any key programmable Yes: by screen, audio and light indicators Yes			
PERIPHERAL ATTACHMENTS	✓ Number of attachments per controller ✓ Low-speed printer devices ✓ High-speed printer devices ✓ Card reading devices ✓ Magnetic tape transports ✓ Printer's word processing quality	The ability to attach a variety of peripheral equipment of various speeds and capacities is a measure of the range of work a system can do.	1-4, or 1-20, any combination 45-165 CPS 3 models 300 LPM and 600 LPM 300 CPM 800 and 1600 BPI Yes			
COMMUNICATIONS PROTOCOLS	✓ Asynchronous ✓ Synchronous ✓ Binary Synchronous — Batch — Interactive ✓ Synchronous Data Link Control (SDLC)	The ability to support more than one protocol — at the same time on the same system — adds immeasurably to the number of tasks and number of networks a system can work in without additional user development effort.	Yes, TTY RS-232 Yes Yes Yes Yes, in 1979			
INTELLIGENT 3270 OPERATIONS	✓ Local format storage ✓ Local printing ✓ Ability to access and update local data bases ✓ Transactions stored locally, batched for transmission to host ✓ Field verification at each terminal location ✓ Application program decides when to go to host	This feature assures that the system can work immediately and easily with the most popular terminal devices in use today, and extend the performance of those devices in a variety of ways.	Yes Yes Yes Yes Yes Yes			
EMULATION CAPABILITIES	✓ 3270 interactive (dumb) ✓ 3270 interactive (intelligent) ✓ 2780 batch ✓ 3780 batch ✓ SDLC batch/interactive ✓ HASP remote job entry ✓ Non-IBM protocols ✓ Specialized protocols	Emulators are software tools that permit a system to operate as a look-alike under other vendors protocols and procedures. Their advantage is to permit direct and immediate attachment to networks using a specific device protocol.	Yes Yes Yes Yes Yes, in 1979 Yes Yes Yes			
DATA BASE STORAGE	✓ Multiple disk storage capacities ✓ Memory management software ✓ Ability to expand to very large local storage	Local data base storage under sound memory management techniques assures powerful local filing, easy off-loading of large central files and elimination of unnecessary communications to and from host.	Yes; from 10 to 320MB Yes Yes; to 320 MB per system			
SOFTWARE LANGUAGE	✓ Assembly language ✓ Strong macro command repertoire ✓ High-level compiler language(s) ✓ Easy-to-learn and use ✓ Numerous screen manipulation and interactive programming aids ✓ Parameter-driven aids where required	Language is the facility that makes it possible to tap the power of the basic system by allowing applications to be written easily. Simple but rich high-level language that can be learned easily by programmers or used by non-programmers extend a system's reach that much further.	Yes; not needed by user personnel Yes; 150 instructions MACROL now; COBOL in 1979 Yes Yes Yes; for format creation and source data entry			
NETWORK ENHANCEMENTS	✓ Concurrent communications operation ✓ Downline control of multipoint networks ✓ Remote program development support for mainframe in any language ✓ Teleprinter network on terminal lines ✓ Downline program debugging ✓ Downline terminal loading ✓ High-speed data transmission rates		Yes; batch and interactive at same time Yes; up to 10 drops per controller Yes Yes, on same lines at same time Yes Yes To 9600 BPS			

Raytheon—50,000+ terminals in use now.

When you select Raytheon, you are selecting a total single-source supplier who has installed more than 50,000 intelligent terminals. A supplier with a worldwide field maintenance organization that is linked together by its own distributed processing network that keeps track of every equipment outage for every customer. A supplier that does not need to offer third-party leasing, because it maintains its own self-financed leasing company. And a supplier whose customer list includes a very high percentage of the world's largest industrial, commercial, financial, insurance and government data systems users.

Raytheon. The company to pick when you've completed your distributed processing checklist.

Tell me more about the CW5178 Raytheon PTS/1200 distributed processing family:

☐ MARK·I
☐ MARK·II

Tell me more about some of the features shown on The Checklist. I'm especially interested in:

1. _____
2. _____
3. _____
4. _____

☐ Have a salesman call.
☐ Send me more information.

Name: _____

Title: _____

Company: _____

Street: _____

City: _____

State: _____ ZIP: _____

Intelligent Terminals, Minicomputers, Distributed and Word Processing Systems

RAYTHEON

RAYTHEON DATA SYSTEMS

1415 BOSTON-PROVIDENCE TURNPIKE • NORWOOD, MASSACHUSETTS 02062

Call Director, Field Marketing, at (800) 225-9874 (toll free)

Inside Massachusetts call (617) 762-6700 • TWX: 710 336-0646 • TELEX: 92-4408

ATLANTA (404) 321-3064 • BOSTON (617) 237-4190 • CHICAGO (312) 694-4420 • DALLAS (214) 661-9722 • DENVER (303) 371-0990 • DETROIT (313) 358-3990 • GREENSBORO (919) 294-5811 • HARTFORD (203) 289-8281 • HOUSTON (713) 771-5851 • KANSAS CITY (816) 561-9333 • LOS ANGELES (714) 979-5800 • MIAMI (305) 592-3884 • MINNEAPOLIS (612) 854-2666 • NEW YORK CITY (212) 661-2790 and (212) 895-2567 • PHILADELPHIA (609) 665-8466 • PITTSBURGH (412) 281-2117 • SAN FRANCISCO (415) 692-4640 • SEATTLE (206) 453-0650 • TULSA (918) 663-7852 • WASHINGTON, D.C. (703) 979-6100 • OVERSEAS: AMSTERDAM (020-93-0787) • FRANKFURT (49-6196-48829) • AUSTRALIA (61-2-297721).

OECD Planning Guidelines

Special to CW

PARIS — A new working group here is preparing guidelines on transborder data flows of personal data for the 24 member countries of the Organization for Economic Co-operation and Development (OECD).

The OECD project is seen as significant because it involves non-European countries, such as the U.S., Canada, Japan and Australia. In addition, economic implications surrounding the free flow of data will be the central focus.

Finally, the second stage of the project involves guidelines for all types of international data traffic.

However, unlike the Council of Europe's draft treaty, which would be binding on all member countries, the OECD guidelines are seen as only recommendations.

A two-day organizational meeting was held here early this month, where Justice Kirby, chairman of the Australian Law Reform Commission was elected chairman. William Fishman of the U.S. Office of Telecommunications Policy was chosen as a vice-chairman.

A subgroup was appointed to prepare the first draft guidelines in order to meet a July 30, 1979 deadline. The results of the group's work is to be forwarded to the OECD Council, composed of ambassadors from the member countries, for approval.

Charged Atmosphere Left After Transborder Meetings

(Continued from Page 65)

posture was right and history will show this to be the case.

Frits Hondius of the Council of Europe observed that legal persons have privacy rights under Article 8 of the European Declaration of Human Rights.

Whether transborder data flows have created urgent problems is a matter of opinion. Alan Benjamin, secretary general of the British Computing Services Association, doesn't think so. There were many more contrary views at the hearing and the conference which followed.

Governments See Problems

Jan Freese, director general of the Swedish Data Inspection Board, opened the proceedings by stating, "In reality the free flow of data is not really free. Most technologies have been regulated; perhaps we have to regulate flows to keep them free."

Giving his impression of the issue, Gerhard Stadler of the Austrian Federal Chancellor's Office said international regulations are needed and can bring advantages "so countries can get a grip on imports and exports of sensitive data." Stadler also noted that "freedom of information is not mentioned in the Gatt, European Free Trade Association or European Community treaties, so it is subject to negotiations and rule-making such as are currently taking place in many countries."

The European community, according to Christopher Layton of the Science and Technology Directorate, needs a DP policy, including privacy protection rules, "to ensure fair competition among the nine countries within the U.S., Japan and other countries."

Outsiders' Role Decried

Rossiter Langhorne of the Manufacturers Hanover Trust, London, complained that financial institutions pay a lot of taxes in the countries where they operate but seem to have little access to government policymaking circles.

An American DP executive observed, "We are kept shadow boxing outside the real bastions of power," referring to the seemingly closed-door nature of national policy formulation and similar walls barring businessmen from deliberations in the European Community, Council of Europe and the OECD.

A siege mentality even may be setting in as some Americans have begun to refer to the "European theatre of operations."

Phil Onstad, speaking for the U.S. Association of Data Processing Service Organizations, urged countries and organizations to avoid unnecessary inhibition to transborder data flows. But the question is how to get a meaningful setting to deterine where the parameters should be drawn.

William Fishman of the Office of Telecommunications Policy spoke of the multi-faceted nature of these issues and warned protectionism must be avoided. A Honeywell-Bull spokesman referred to a mammoth misunderstanding of the problem — "because the free flow of legitimate business information doesn't threaten economic or social interests of exporting countries."

To get this dialogue going and involve more American businessmen, several of the U.S. participants suggested the European officials should come to the U.S.

Since an informal atmosphere is preferred by most of the European principals, the invitations recently extended by the Online organization of Uxbridge, England, to speak at an expanded follow-up conference in New York City November 28-30 have been quickly accepted.

It is widely recognized, of course, that informal discussions, regardless of their usefulness, are stop-gap measures. The U.S., in particular, is facing the need to respond to a 1978-1979 schedule of international conferences and working groups which are hammering out rules for transnational data flows.

The conference format, nevertheless, allows Ameican businessmen into the arena which should result in important inputs and support to U.S. policymakers.

FREE UPGRADE CONSULTATION
IN IBM SMALL SYSTEMS

OUTGROWN Your Current
S/3 OR S/32?

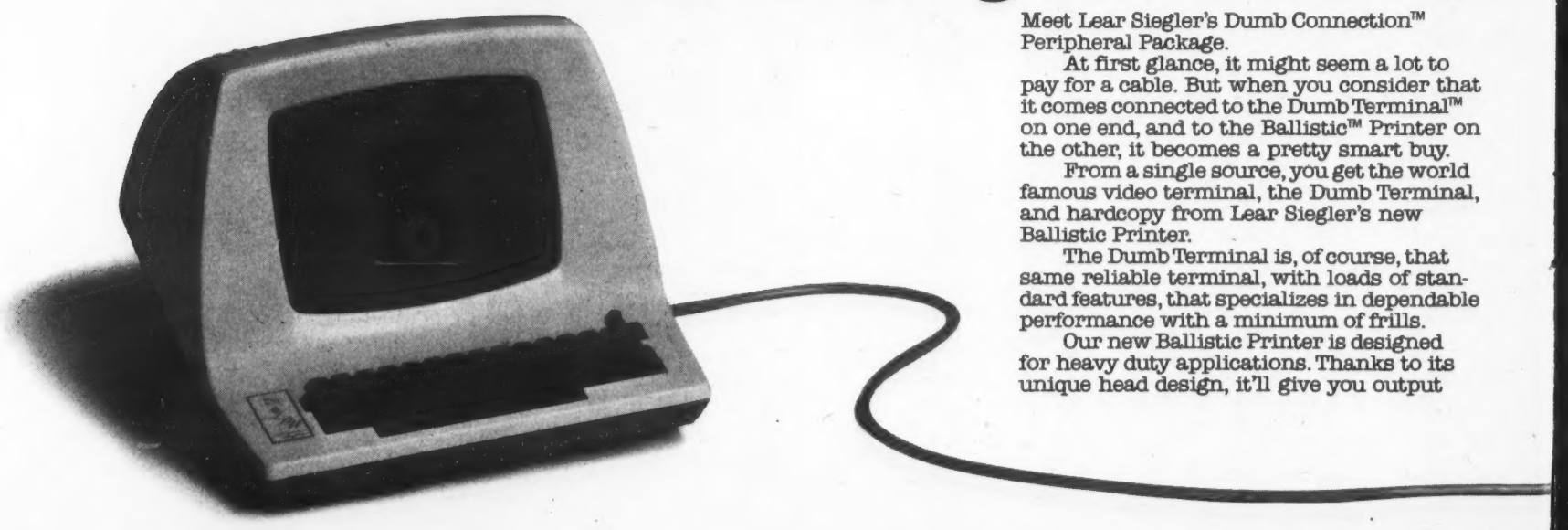
You need our EXPERT IBM GSD HARDWARE KNOWLEDGE. We have OVER 100 YEARS of IBM Small Systems Experience to assist you in:

- Exercising Purchase Options
- Buying
- Leasing
- Selling
- Sub-leasing
- Trading

GET YOUR ANSWER NOW — CALL

AMERICAN USED COMPUTER • 617-261-1100
P.O. BOX 68, KENMORE STATION, BOSTON, MASSACHUSETTS 02215

Introducing the $3890



Meet Lear Siegler's Dumb Connection™ Peripheral Package.

At first glance, it might seem a lot to pay for a cable. But when you consider that it comes connected to the Dumb Terminal™ on one end, and to the Ballistic™ Printer on the other, it becomes a pretty smart buy.

From a single source, you get the world famous video terminal, the Dumb Terminal, and hardcopy from Lear Siegler's new Ballistic Printer.

The Dumb Terminal is, of course, that same reliable terminal, with loads of standard features, that specializes in dependable performance with a minimum of frills.

Our new Ballistic Printer is designed for heavy duty applications. Thanks to its unique head design, it'll give you output

Small Business Needs Relief, Quantor Tells SEC

WASHINGTON, D.C. — Small companies will cease to be industry's major source of innovation unless they are given relief from the growing tangle of government regulations that limit their ability to obtain financing, a computer industry official recently testified here at a special Securities and Exchange Commission (SEC) hearing on the problems of small companies in raising capital.

Charles Askanas, chairman and president of Quantor Corp., said the business environment is increasingly influenced by policies and laws that impede capital accumulation. The result will be fewer new companies formed in the years to come.

"There will be no small companies formed unless there are rewards consistent with the risk," Askanas said. He remained optimistic that "people who are strong enough to start and manage small technological companies which depend on innovation and creativity can — and will — continue to contribute to industry progress."

Askanas' firm markets equipment used to convert computer data to microfiche. Quantor, which was founded in 1969, became publicly held in 1970. In 1977, the company reported profits of $1.6 million on revenues of $23.5 million.

Noting his small company competes successfully against industry giants, Askanas urged the SEC to spearhead actions that will aid small companies in raising capital.

Jeopardizing Factors

Askanas said that one factor jeopardizing the future of small companies is the Tax Reform Act of 1976, which raised the effective maximum capital gain rate, thereby eliminating the capital gains advantage for the people who historically have been investors.

In addition, Askanas cited the Pension Reform Act of 1974 (Erisa) as another factor discouraging investment in small companies.

While Askanas acknowledged that certain elements in Erisa were needed, he said "pension fund managers are now tending to be very conservative and are investing in 'blue chips' only. This has been a disaster for small companies, since a major source of investment funds has disappeared."

Other obstacles to capital formation, according to Askanas, are inflation which encourages short-term speculation and makes long-term high-risk investments more difficult, and the elimination of fixed commissions, which has resulted in reduced income for securities brokers and subsequently diminished interest in smaller companies.

Askanas also pointed to the problems of small companies going public, particularly in view of the high registration and underwriting fees.

Disclosure Requirements

In the area of disclosure, Askanas noted that the current requirements provide a competitive advantage to the larger companies, as well as creating prohibitive reporting costs for the smaller companies.

Using Quantor as an example, Askanas described the plight of the small company: "We are the only small, independent manufacturer in the computer output microfilm [COM] field. It is very difficult for us to find out information about our competitors' performances in the COM systems business, since it is such a small part of their revenue."

He noted, however, the industry giants can find whatever they want about Quantor by reading the 10-K report. Therefore, required financial reporting standards operate as a competitive disadvantage to Quantor.

To encourage small high-technology companies and provide them with adequate financial bases, Askanas proposed the following:

- The SEC should proceed to implement Form S-18, but it should allow local filing to reduce the time and costs involved.
- The periodic reporting requirements for companies with annual revenues of less than $100 million should be substantially reduced.
- At a mimimum, the 10-K report should be modified so the information required does not put small companies at a competitive disadvantage because of the extent of the required disclosure.
- The commission should exempt local offerings in states where there is a strong local Blue Sky Commissioner and when the company qualifies under the Blue Sky laws.
- The commission should encourage Congress to modify Erisa to stimulate pension fund investment in small companies.

Askanas also urged the commision to encourage Congress to reduce the tax on capital gains.

'Being Fired by a Computer Is Bad Enough, But What I Want to Know Is How It Got Controlling Stock.'

If you think shipping computer supplies in 24 hours is a bluff, call us on it.

800-258-1710.

The fastest way to get Digital computer supplies is to call us direct. We'll ship orders in 24 hours; in emergencies, less than 24 hours.

You'll not only get the fastest service you've ever had, you'll also be getting the most thoroughly quality tested supplies for Digital computers you can buy. All at a minimum 5% discount.

If you don't have our supplies brochure, give us a call at the same number. Monday through Friday, 8 AM to 6 PM EST.

800-258-1710. In New Hampshire, 603-884-5718. For your convenience, you can order supplies from us on your Master Charge or American Express cards.

If you think it's a bluff, all you have to do is call.

digital
SUPPLIES

Dumb Connection.™

almost as long as you want to give it input. At 180 cps.

The Dumb Connection. Another reasonable, cost-effective product from Lear Siegler. For those who always wanted a Dumb Terminal, but needed hardcopy, too.

Now you can have the best of both worlds. And the connection to go with them. In one package.

Dumb Connection.™
Smart Buy.

LEAR SIEGLER, INC.
ELECTRONIC INSTRUMENTATION DIVISION
DATA PRODUCTS

Model 210

Lear Siegler, Inc./E.I.D., Data Products,
714 N. Brookhurst St., Anaheim, CA 92803; (800) 854-3805. In California (714) 774-1010.

The custom leasing people

OPM

Invite you to its Annual Computer Leasing Workshop for computer users.

PORTLAND – May 3rd, 1978
DENVER – May 4th, 1978

"An Understanding of Today's Computer Leasing Complexities, Plus a Look at Tomorrow's Opportunities"

HOSTED BY

Mordecai Weissman, President
Myron S. Goodman, Executive Vice President

Future Seminars

PITTSBURGH – May 11th, 1978
HOUSTON – May 17th, 1978
ST. LOUIS – May 18th, 1978
BOSTON – June 1st, 1978
WASHINGTON, D.C. – June 6th, 1978
DALLAS – June 15th, 1978
MINNEAPOLIS – June 21st, 1978
DETROIT – June 22nd, 1978

R.S.V.P. Ms. Ofelia Loret De Mola: 1-800-221-2674, 1-212-747-0220

O.P.M. Leasing Services, Inc.
71 Broadway, New York, NY 10006

Aims at Improved Print Quality

Daisy-Wheel Maker Enters Matrix Printer Area

HAYWARD, Calif. — Why would a company with 70% of its business tied to daisy wheel printers suddenly begin extolling the virtues of a matrix printer?

Because, according to Ridley Rhind, vice-president of marketing for Diablo Systems, Inc., "We learned that users who drive 'daisy' printers at 30-, 45-, 55 char/sec would gladly use a matrix that went at 100- to 200 char./sec if they could attain reasonable print quality."

Armed with this knowledge, Diablo recently began marketing the Model 2300 matrix printer with three capabilities that reportedly improve print quality.

The Model 2300 double-strikes each upper and lower case character to produce more fully formed character impressions at speeds of 100 char./sec, Rhind noted.

Another feature is the new "ballistics" print head with a 7 by 9 wire matrix that prints denser characters than normally attainable on the more commonly used 5 by 7 matrix heads, Rhind continued.

Third, under either program or operator control, the 2300 can mix up to five different fonts during a single printing job. Rhind claimed no other printer has that capability.

The 100 char./sec higher quality matrix is an acceptable alternative to the Hytype II daisy printer for most low-speed printer applications, including word processing work where "letter quality" is a requirement, according to Rhind.

"The value equation is simple," he said. "Double your output at less cost, with perhaps a 20% sacrifice in fineness of impression. It makes economic sense for a user."

Diablo's push towards matrix printers may seem out of place, but, according to Rhind, "The total market for daisy products is bigger than any one company can serve and is growing very fast. Matrix printers offer an increasingly attractive option in many such applications. We don't see our matrix lines impacting our daisy lines; we see extraordinary growth in both areas."

As worldwide markets evolve, Diablo sees daisies, matrices and ink-jet devices becoming established products within a variety of speed-range markets.

Cost breaks in printing or disk mechanisms will not be as dramatic as cost reductions in electronic components, Rhind predicted. Therefore, improving product reliability, flexibility and utility in the different speed and capacity ranges will be a market requirement.

Diablo's printer business, which began with initial shipments of Hytype I daisy printers early in 1973, currently accounts for more than 70% of the company's annual sales, Rhind said, with OEM disk drive operations and a recently developed OEM small business system — the Diablo 3200 — accounting for the remaining 30%.

All product lines are internationally distributed.

Executive Corner

• Vincent S. Lamb Jr. has been elected chairman of the board at Scientific Systems Services, Inc. Lamb has also been appointed president and treasurer. The board also appointed William A. Grimm as director of the firm.

• William J. Alznauer has been named vice-president of international operations at Perkin-Elmer Data Systems Group.

• Brij Prasad has been elected vice-president of manufacturing at Adage, Inc.

• Bruce Bambrough has been elected chairman of the board, president and chief executive officer of Compuscan, Inc.

• William S. Bivens has been appointed director of corporate development at Digital Systems Corp.

• Don Tighe has been appointed vice-president of engineering at Powertec, Inc. Susan Croy was appointed manager of industrial relations.

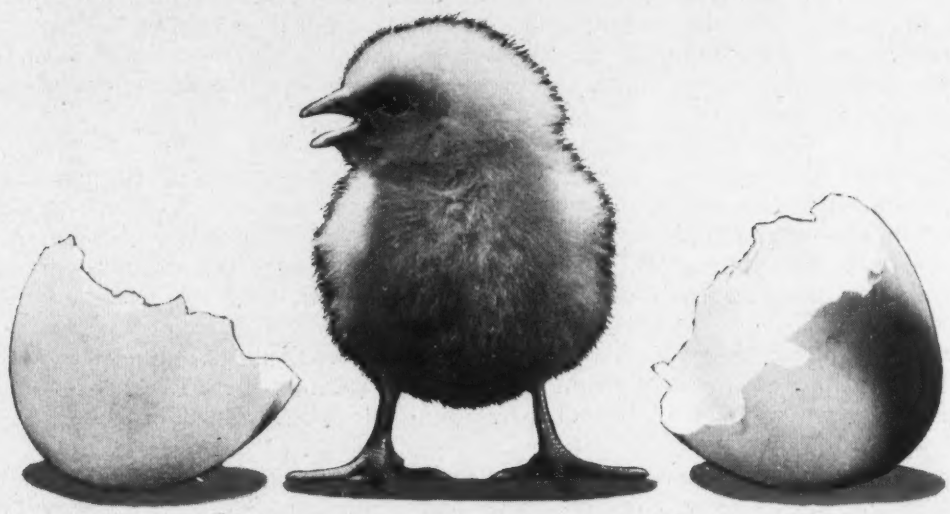
• Donald W. Lessard has been named vice-president of manufacturing at Kybe Corp.

• Daniel A. Hosage has been promoted to senior vice-president at Datapoint Corp.

• Robert E. Kunkle has been elected president of Diva, Inc. Ronald S. Harmon has been elected executive vice-president of engineering and manufacturing.

ELEX
MEANS
Small Systems Leasing For A Lot Less
Save up to 60% on your installed or on-order System/3 or other computer system with our new purchase and leaseback program—ELEX/3.
The Equipment Lease Exchange Inc.
P.O. BOX 14
MEDFORD, NEW JERSEY 08055
609/654-1100

dc
SIM-14™
dc
It'll give your 1401* programs a new lease on life.



• IBM 303X, AMDAHL, CDC, ITEL users...SIM-14 means *no re-programming!*

• IBM 360/370 users...SIM-14 means running multiple programs *simultaneously!*

If your new whizzer has made your 1400 series program old before its time, our simulator can give it instant new life with features like...

...a self-relocating problem program that's completely interruptible; no hardware restrictions other than decimal arithmetic set; no control storage or micro codes; full tape and disk support; support for 1400 utilities and sort replacements included...

And more. Enough, in fact, to fill its own manual. To get your copy—*and to find out how "cheep" SIM-14 can be*—call your nearest Dearborn office.

***Includes 1440 and 1460 programs**

dc dearborn computer company | dealer-IBM computers systems software leasing

1460 renaissance drive/suite 400/park ridge, illinois 60068 (chicago)/(312) 827-9200

toronto (416) 621-7060 • st. louis (314) 727-7277 • houston (713) 965-0788 • dallas (214) 748-5899

member, CLA; ADAPSO; SIA

Anticipates Continued Growth

Apple Vying for Share of Home DP Market

By a CW Staff Writer

CUPERTINO, Calif. — As soon as low-cost computers were available in configurations designed for use by consumers, with programming features and language that nontechnicians could use, the personal computing market began to grow rapidly, according to Apple Computer, Inc., one of the firms vying for a share of that blossoming market.

With more than 100,000 units sold, the personal computer market is finally being recognized as much larger than the original hobby market, a spokesman stated, observing that there have already been forecasts of $2 billion in sales by 1985.

Apple, which introduced a self-contained personal computer (Apple II) in June 1977, believes the personal computer will make home life better for middle-income families. The spokesman said such systems will provide for better financal decision making and tighter control over family finances, better protection against fire and theft, better environmental control with attendant energy cost savings and more free time for all family members.

Additional benefits, he predicted, will include better educational opportunities, lower cost communications, immediate access to all family records and increased family interaction through the entertainment aspects of the systems.

At present, the vast majority of nonbusiness computer users are still considered to be hobbyists, Apple noted, because until self-contained machines like Apple II came along, home computers required some technical understanding to assemble and program them. Now, the self-contained machines can be taken home, unpacked, plugged in and put to work.

Largest Share

Considering all purchases of nonbusiness computers, estimates are that hobby computers accounted for 67% of all sales in 1977, Apple noted. The home computer, requiring no technical knowledge or assembly, accounted for only 3% of that market, with other markets accounting for the remaining 30%.

This is expected to change dramatically in 1978, Apple said. Home computers will take 17% of the market while the hobbyist sector will account for 35%. The home market will dominate the scene by 1982, accounting for 56% of all sales of personal computers, Apple predicted.

These figures do not include computer systems sold for entertainment purposes, which are generally considered part of the personal computer market even though they offer only preprogrammed games.

The true home computer, by comparison, provides the capability for entertainment in addition to its other possible uses. This entertainment segment of the consumer market accounted for about 18% of total personal computer sales in 1977 and will account for about 29% by 1982, Apple said.

Apple was founded in January 1976 by Steven Jobs and Steven Wozniak for the purpose of developing and marketing personal computers. The firm's first product, Apple I, was essentially intended for the knowledgeable hobbyist. Apple received equity financing from Venrock Associates, Capital Management, Inc. and Arthur Rock this March.

NCC. Computerworld's got it covered—as only a newsweekly can.

This year's National Computer Conference promises to be the biggest ever. More than 40,000 people are expected to visit the record-breaking 1400 booths in the main show; and thousands more will be attending the newly-expanded *Personal Computing Festival* — including exhibits, speakers, and technical sessions on this fast-growing area of the computer world. And, of course, *Computerworld* will also be at NCC — to hail it, unveil it, and wrap it up — in three informative, important issues full of NCC news.

May 29th—Preview Issue: A complete rundown of the companies, products and services, keynote speakers and technical sessions you'll see at NCC. Plus — a guide of things to see and places to go in the Anaheim area. This issue will help you make the most of your time at NCC. (If you forget to bring your copy of *Computerworld* you can pick one up free at our booth — while they last.)

June 5th—Show Issue: Our Show Issue will include all the late breaking stories, program changes, intended product announcements and behind-the-scenes show details leading up to NCC. (It will also be available at our NCC booth.)

June 12th—Wrap-up Issue: Cohesive analysis and summary of the significant events of the '78 NCC. This issue will give details on product announcements and will review the content of program sessions, experts' observations and keynote speeches. The important events of NCC will be summarized here.

If you're a manufacturer or marketer in the computer field, don't miss these ad closing dates for *Computerworld's* NCC issues:

Preview Issue: (May 29th)—Color and Insert close: May 12; black & white close: May 19.

Show Issue: (June 5th)—Color close: May 19; black & white close: May 26.

Wrap-Up Issue (June 12th)—Color close: May 26; b&w close: June 2.

For all the details contact your *Computerworld* salesman. He can give you special assistance in NCC ad planning. Or call Terry Williams at (617) 965-5800 to reserve space for your ads.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Boston	New York	San Francisco	Los Angeles
Bob Ziegel	Don Fagan	Bill Healey	Judy Milford
Mike Burman	Frank Gallo	Jim Richardson	Bill Healey
Frank Collins	(201) 461-2575	(415) 421-7330	Jim Richardson
(617) 965-5800			(213) 475-8486

Market Increase For POS Units Seen in Europe

NEW YORK — The European market for point-of-sale (POS) terminals, electronic cash registers (ECR) and related equipment will bring in revenues of about $5 billion during the next 10 years as European retailers shift to electronic systems, according to a recent study by Frost & Sullivan, Inc.

Two major sectors of the market are the POS systems segment, consisting of input devices used to gather data as part of a total merchandising system, and an ECR market, for sales analysis capability at low cost.

The report predicted the ECR market will bring in $3 billion during the next 10 years, while POS systems' revenue will hit the $1.3 billion mark and related equipment such as scanners and communications devices, including modems and interfaces, will account for a little less than $1 billion.

Opportunities for expansion will exist as mechanical cash registers phase out by 1982 and present electronic systems with life cycles of less than 10 years, become obsolete toward the latter part of the 10-year forecast period, Frost & Sullivan said.

The study, which separately analyzed the markets in 16 western European countries, revealed that the type and proportion of retail stores in each country and their equipment needs do not follow any set pattern, thereby complicating marketing strategies for firms interested in pursuing European prospects.

The report is available from Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

EMM Officer Turns Around Caelus Operation

ENCINO, Calif.— Managers at Electronic Memories and Magnetics Corp. (EMM) have been pumping new life into its Caelus division by reorganizing or eliminating unprofitable product lines.

Involved in the founding of Caelus Memories in the 1960s, EMM became committed to the disk drive and disk media business by purchasing Caelus in 1971. More than three years ago, EMM assigned the operation to Vice-President Ed Farris with a charter: make it profitable or get rid of it. Farris has a reputation for turning around some "doubtful" properties.

Prior to Farris' arrival, the Caelus drive operation had not moved with the changing market and lost out on the growth experienced by some of its competitors. Upon taking over, Farris established separate divisions and profit-and-loss status for the disk drive operation (now Peripherals Products Division) and the media operation (Media Products Division). He then evaluated three possible courses of action for the drive division:

- See what the market would bring for the operation and sell if the price was right.
- Make the changes necessary to make it profitable.
- Close it down if neither of the other options were feasible.

Farris brought in Fred Wolff, a longtime EMM associate known at the company as an austere operations manager. Together they evaluated the operation and started making changes. They pared down the general and administrative management, cutting out a layer they felt they could do without.

Wolff then started making changes in the manufacturing operation, designing a more efficient, streamlined plant to increase output without increasing labor content and introducing some assembly techniques. Concurrently, he took a careful look at the inventory that was being carried and made reductions and changes.

Sale to Ball

EMM had a separate R&D facility which was developing a specialized disk drive (compatible with the California Computer Products, Inc. Trident). This represented a significant overhead cost to the division.

Farris sold R&D and the product line to Ball Computer Products. Ball needed the product for its systems operation and couldn't wait for a startup operation to get off the ground; EMM needed the reduction in overhead costs.

Wolff found that in order to survive in a market dominated by a few suppliers, he had to improve the quality of product to ensure competitive pricing and a reasonable delivery. He found several products that weren't worth keeping and dropped them.

Growth also became dependent on having the latest generation of product. Farris made a detailed market study and then got the corporation to back his development of a new generation of drives in 1977 for delivery in 1978.

These drives will increase the company's product capacity range to 76M bytes. They use up to three fixed disks and a removable cartridge. Wolff is projecting volume shipments in late 1978.

EMM has attracted a cross-section of customers — from large OEMs to small, highly specialized systems houses. Another EMM division, Commercial Memory Products, has taken delivery of a number of drives for its small business system (the System 800).

Bottom Line Moves Up

As a result of all these moves, the bottom line in fiscal 1977 showed a net profit of about 8% on revenues of more than $4 million for the Peripheral Products Division.

Farris is very bullish for 1978. With the backlog in disk drives, he could almost double revenues in a year, he said.

He also noted the company is shipping drives at a record rate. "We feel that we're in a position to become aggressive in our marketplace. We've got the products, production capacity and commitment to make it all work — profitably," he added.

However, he doesn't rule out the possibility of selling out if the right price were offered. "You have to look at each deal on its own merit," he pointed out.

Three divisions once on the "doubtful" list now report to Farris. They are all profitable, representing collectively about 30% of the company's 1977 revenues and a significant contribution to the bottom line.

Contracts

MSI Data Corp. has received an order from Data Systems Corp. for 200 Source 6600 data entry terminals. The order is valued at approximately $750,000.

Beehive International has signed a two-year contract with Western Union Data Services Co., Inc. to supply a variety of terminals. The contract is valued at between $280,000 and $2,000,000 depending on the number of terminals ordered.

Imlac Corp. has received an OEM agreement in excess of $400,000 from Hughes Aircraft Co., Industrial Products Divison, Carlsbad, Calif., for interactive computer display systems. The systems will be used in the Hughes AM-1 automatic marking system for the garment manufacturing industry.

DO YOU QUALIFY?

OUR PRODUCT WAS DESIGNED FOR THE VANGUARD OF THE COMPUTER INDUSTRY. SOPHISTICATED USERS RECOGNIZE THE VERSATILITY OF OUR MACHINE AND HAVE BEATEN A PATH TO OUR DOOR.

We've installed our revolutionary computer system, the QM-1, in Fortune 500 Aerospace Corporations, Universities, the Military, major System Houses and in a giant Computer Manufacturer.

They purchased our system because:

- The QM-1 was specifically designed to enable you to emulate any computer or, for that matter, any peripheral or digital device.
- When an emulator is running, the QM-1 architecture is transparent to the user. Software developed on the QM-1 will run on the machine which has been emulated. The opposite is also true; application and system software from the "real" machine will run unchanged on the QM-1.
- QM-1 customers have emulated commercial, militarized, avionic and special purpose computers. They range from micros to fourth generation Large Scale General Purpose Systems.
- Users are not limited to one system identity; they can emulate as many kinds of computers as they like, even run multiple emulations of different systems concurrently.
- The QM-1 allows you to contol and monitor the emulated system, even primitives like gates, data busses and registers. You can use it to design new computers.

Here's what QM-1 users have found to be true:

- Emulators on the QM-1 are running one hundred times faster than simulators on more expensive systems.
- The QM-1 is an easily modified, reusable breadboard to verify and validate device design.
- The QM-1 is without equal as a software development tool for any computer. It will also protect investments in software running on destandardized machines.
- The QM-1 is an excellent design tool for analyzing software structure, system composition and hardware/software trade offs.
- The QM-1 is ideal in a computer science environment for instruction and research into hardware and software architecture.

Prices range from $190K for a minimum system configuration, capable of running Nanodata supplied software, to upwards of $700K for a multiprocessor. A "typical" customer configuration sells for $280K and includes emulators of the PDP 11, Data General NOVA, IBM 360, etc.

Do you qualify as a prospective user? If you do, then write for additional information or, better still, call Michael Senft, Director of Marketing.

NANODATA CORPORATION

2457 Wehrle Drive • Williamsville, N.Y. 14221 • (716) 631-5880

So Gains Won't Be Devoured

Tax Planning Essential to Sellers of DP Firms

By Brian J. McGowan
Special to CW

The seller of a data processing/software firm has only two general choices. He can sell the stock of his corporation or he can sell all of the assets and liquidate his corporation.

Although the seller can sell his corporation's assets and not liquidate the corporation but retain the corporate shell investment, for purposes of this article, we will presume that he desires to liquidate his corporation.

The seller is driven by obvious goals: he wants to avoid seeing his sale proceeds become a full course meal for the Internal Revenue Service (IRS). This requires thorough and timely tax planning.

The sale of corporate stock is a relatively simple tax transaction for the seller. The seller simply compares the selling price for the stock with his tax basis — the difference being capital gain or loss which must be reported on his personal tax return. Tax basis determination is a seller's investment in his corporation. If the seller receives the consideration in a lump sum, the entire gain must be reported in the year of the sale.

This is the second of two articles on the income tax consequences of purchasing or selling a firm in the DP industry. This article covers the consequences from the seller's viewpoint; last week's dealt with the buyer's perspective. Neither part is meant to be an exhaustive treatise but rather a general summary of appropriate provisions in the Internal Revenue Code.

While everyone knows capital gain treatment is desirable since the U.S. taxes only one-half of the gain, many sellers are not aware of an extremely expensive change to capital gains made by the Tax Reform Act of 1976. Although 50% of the gains still go untaxed for normal income tax purposes, this same forgiven amount is now subject to what is known as the minimum tax, which packs a 15% tax wallop in addition to the normal tax.

Congress, in a moment of largesse, recognized the damage this tax would cause and permitted a deduction equal to the greater of $10,000 or one-half of the taxpayer's regular income tax liability.

For example, assume that a seller has a gain of $100,000 and a regular tax liability of $15,000; 50% of the $100,000 gain escapes tax, but is exposed to the minimum tax. After the seller takes the maximum deduction of $10,000, the remaining $40,000 is subject to the 15% minimum tax — an additional $6,000 tax.

Installment Alternative

An alternative to selling stock for a lump sum is to sell the stock on the installment method. Assuming specific statutory ground rules are followed, the effect to the seller is to spread the gain over a protracted period, avoiding the "bunching" effect of reporting the gain in one year.

A side benefit is to minimize, if not anesthetize, the minimum tax by spreading the capital gain over a number of years, each year being entitled to the $10,000 or 50% tax liability deduction.

So far we have discussed a taxable sale of stock. A seller can defer tax on the gain by disposing of his stock in a stock-for-stock exchange rather than selling his stock for cash (assuming the buyer is a corporation). While a seller still experiences an economic gain measured between the tax basis of his stock and the fair market value of the stock received in the exchange, no gain is recognized for tax purposes until he ultimately disposes of his new stock.

The seller can minimize his tax liability by judiciously timing the sale of his new stock.

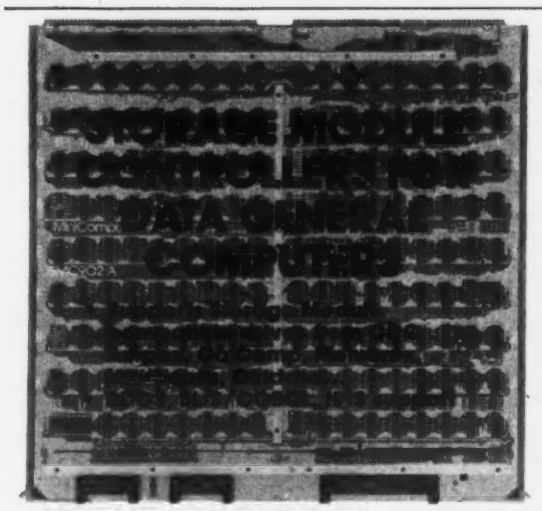
Liquidating Corporation

Instead of selling stock, the seller can sell the assets of the corporation and liquidate his corporation, receiving a final cash distribution. The most frequently employed method of accomplishing this is to sell the corporate assets and liquidate pursuant to Section 337 of the Internal Revenue Code.

This section of the law provides that if, within 12 months of adopting a plan of complete liquidation, a corporation distributes essentially all of its property, then no gain or loss will be recognized on sale of property during the 12-month period. Therefore, tax at both the corporate and shareholder levels will be avoided. Only the shareholder will be taxed.

In our industry, the expenses relating to the development of software could be completely recaptured. This issue alone could dissuade a seller from selling assets instead of stock. The tax at both the corporate and shareholder levels could easily leave the seller hopelessly watching complex and unsettled Internal Revenue Code sections devour his sale proceeds.

A former IRS agent, McGowan is now chief financial officer for Sun Information Services, Co.



SMC902 $2160 (at 10 per year)

MiniComputer Technology

2470 Embarcadero Way • Palo Alto CA 94303

I need more input on the SMC 902.

Name _____

Company _____

Address _____

City _____ State ____ Zip ____

MiniComputer Technology

you can be well connected for only $1285 or $38 per month.

The all new 43 Teleprinter, with Acoustic Coupler, is ready for immediate delivery. This quiet desktop impact printing terminal features full ASCII character set, buffered 10 or 30 cps operation. It prints up to 132 characters per line on regular paper. Modular, solid-state construction and self-test ability means easy maintenance. And, the 43 Teleprinter, is supported with nationwide service.

Time-Sharing Data Entry Communications

43 Teleprinter with Acoustic Coupler

READY FOR IMMEDIATE DELIVERY

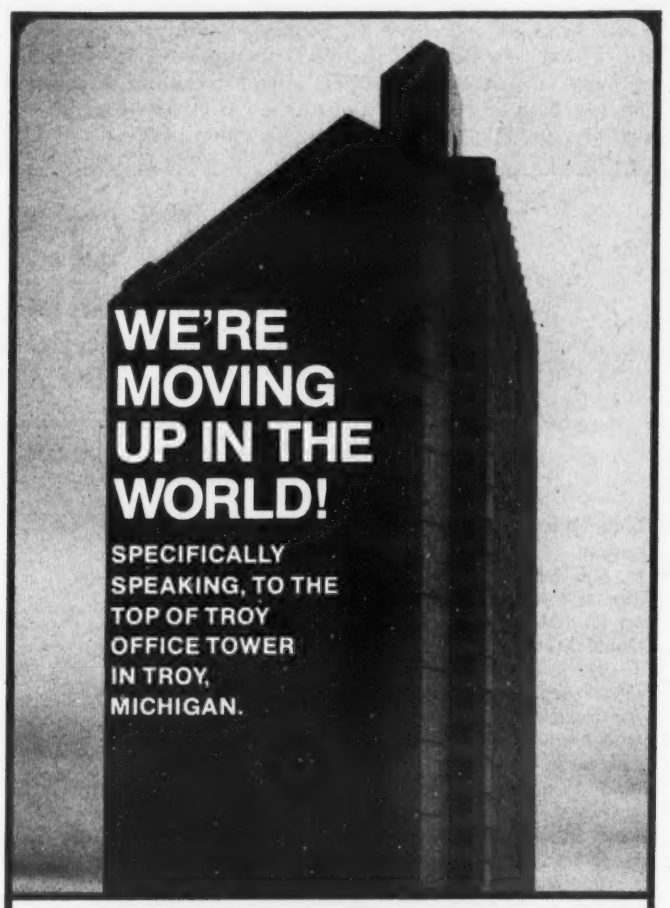
only $1,285.00 or $38 per month

At Management Response, we are your Terminal Connection. We also have DEC LA-36, LS-120, LA-180, VT-52, Regent 100, and more. READY FOR IMMEDIATE DELIVERY.

Order now, right from our stock, CALL TOLL FREE: (800) 323-2135

management response corporation

660 busse highway/park ridge, illinois 60068/(312) 698 3377



Effective Monday, April 17th., 1978, CMI Corporation will begin operations from it's new International Headquarters in Troy, Michigan.

Write for our new Annual Report and discover why CMI's steady financial growth and aggressive marketing techniques have made them the nation's largest privately held third party IBM dealer.

CMI CORPORATION
Top of Troy, W. Big Beaver & I-75,
Troy, Michigan 48084. (313) 362-1000.

CMI The IBM Specialists
CORPORATION
Top of Troy, W. Big Beaver & I-75, Troy, Michigan 48084. (313) 362-1000.
1500 N. Woodward Ave., Birmingham, Mich. 48011, (313) 642-8000
Member Computer Dealers Association

There is no other reference source like it in the computer world

The Computerworld Index is a complete guide to the editorial contents of *Computerworld,* the weekly newspaper for the computer community. Every story, article, newsnote, editorial or commentary is indexed by subjects covered and names of any companies mentioned.

The Index breaks topics down to highly usable and convenient categories, including:

- Products or services, like PRINTERS or LEASING
- Industries like INSURANCE
- Types of computer applications, such as INVENTORY SYSTEMS or ACCOUNTING SYSTEMS
- Regulatory, security or social issues, like PRIVACY or PRIVACY ACT OF 1974
- Legal aspects of computer use, such as LITIGATION
- Foreign countries, such as JAPAN, or ITALY.

All together, there are approximately 3,000 category headings and 10,000 individual entries in the annual issue of a typical index. And if you have a need for information on almost any aspect of the computer world, the INDEX will lead you to it.

The Computerworld Index is published quarterly — cumulative for the year — and is available for an annual subscription of only $150 (4 issues). You can also order back issues of the INDEX, covering all issues of *Computerworld* since July, 1976, at reduced rates.

We'll be glad to send you more details including a sample page and a subscription form. Just send in the coupon, or give us a call at (800) 225-3080 (toll free).

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

To: "INDEX"
Circulation Dept.
COMPUTERWORLD
797 Washington Street
Newton, MA 02160

Yes, I'd like more details on your 1978 COMPUTERWORLD INDEX, including special rates on the 1977 and 1976 volumes. Send to:

Name _____

Title _____

Company _____

Address _____

_____

Memorex Net Rises

SANTA CLARA, Calif. — Memorex Corp. reported earnings for the first quarter at $14.4 million or $2.14 a share. The figures include extraordinary income of $5 million from a tax loss carried forward.

Comparable performance for the same period in 1977 accounted for earnings of $13.7 million or $2.21 a share including a $5.4 million extraordinary credit.

First-quarter 1978 revenues totaled $138.9 million, a gain of 34% over the $103.8 million reported in 1977, when the quarter was restated to reflect the acquisition of Business Systems Technology, Inc.

First-quarter 1978 results also show $12 million revenues from Telex-Europe operations, acquired Jan. 1 for cash and notes.

The costs of acquiring Telex-Europe, increased expenditures for its antitrust suit against IBM and the cost of moving the Communications Group were factors Memorex reported as having a negative impact on profits.

Total debt at Memorex increased $19.4 million in the quarter to $147.3 million from $127.9 million at year-end, the firm said.

Total shareholders' equity, however, increased to $126.2 million in the quarter from $112.1 million, a gain of $14.1 million. Common shareholders' equity increased to $60.2 million from $46.2 million. The company also achieved retained earnings of $9.5 million.

First Quarter at Honeywell Sees Performance Increases

MINNEAPOLIS — Revenue, net income and earnings per share increased for Honeywell, Inc. for the first quarter of 1978 compared with performance in the year-ago first quarter.

Financial News

Worldwide sales, rental and service revenues reached $787.1 million, an 18.7% increase, compared with $663.1 million in the first quarter of 1977.

Earnings for the quarter were $35.4 million compared with $30.9 million in the year-ago quarter. Earnings per share were $1.66, an increase of about 13% over first-quarter 1977 per-share earnings of $1.47.

Net earnings were 4.4% of sales for the first quarter of 1978 compared with 4.5% of sales for the same period in 1977.

Equipment sales were 80% of first-quarter revenues, with rental and service comprising the remaining revenue.

The acquisition of Synertek, Inc., a designer and manufacturer of integrated circuits, was completed during the first quarter, and Honeywell purchased 368,753 shares of its own stock in the open market to replace shares issued to close the merger.

In addition, General Electric Co.'s holdings of Honeywell stock have been reduced to less than 200,000 shares as a result of Honeywell's purchase of General Electric's computer business.

"The computer business was particularly strong in the first quarter compared to last year, with improved bookings, revenue and profit performance both in the United States and outside," the firm said. "Worldwide computer orders were up substantially and computer backlogs remain at a high level. Computer rental and service revenues in the first quarter increased 18.8 percent over the comparable 1977 period to $164.7 million. Outright computer sales were up substantially, the firm claimed.

Earnings at DPF Hit $6 Million

HARTSDALE, N.Y. — DPF, Inc. reported earnings for the nine months ended Feb. 28, of approximately $6.1 million or $1.44 a share on revenues of $369.7 million.

This compared with earnings of $3.1 million or 74 cents a share on revenues of $351.8 million in the same period a year ago.

Computer equipment leasing accounted for $33.3 million in revenues for the nine-month period compared with $20.4 million in the comparable year-ago period.

The major portion of the firm's revenues were derived from the 1977 acquisition of Interstate Brands Corp., a commercial bakery.

Quarter Records Posted by Itel

SAN FRANCISCO — Itel Corp. reported the highest first-quarter results in its 10-year history with earnings reaching $7.4 million or 63 cents a share on revenues of $123.5 million.

Comparable figures for the same year-ago period showed earnings at $4.5 million or 50 cents a share on revenues of $78.6 million.

The performance during the quarter reflected gains in both marketing and provision of services related to transportation and equipment, Itel said.

Since the year-end, Itel has placed more than $175 million of long-term fixed rate debt in the U.S. and overseas.

These countries represent three quarters of the worldwide computer market

These publications reach key computer executives in all of these countries

And you can advertise in all of them through us.

The International computer market is incredibly concentrated. More than 40% of the world's general purpose computer systems are found in the United States alone, and another 30% can be found in the next four largest computer using countries (Japan, Germany, United Kingdom and France). Add Italy (8th) and Brazil, and you get more than 75% of worldwide general purpose computers. (1)

All of these foreign countries are also heavy importers of U.S.-made computer products and services, with almost a billion and a quarter dollars of imports from the United States in 1976. (2)

As publishers of *Computerworld, Computerwoche, Computer Management, Shukan Computer* and *Data News;* and U.S. representatives of the French and Italian publications, we can give you one-stop advertising service in all of them — including translation and production services. We can also send you one bill — in dollars. So it's as simple as placing space in U.S. publications.

We'll be glad to send you a free market brief with more facts on the international marketplace for computers, as well as information on each publication. Just send in the coupon or give us a call.

Notes:
(1) Measured by value, based on data from International Data Corporation, the world's leading EDP market research company. General purpose computer systems do not include minicomputers or small business systems.
(2) U.S. Commerce Department figures.

CW COMMUNICATIONS/INC.

To: **Roy J. Einreinhofer,** Vice President, *Marketing*
COMPUTERWORLD, 797 Washington Street
Newton, MA 02160 (617) 965-5800

I'd like a free copy of your marketbrief, "The International Marketplace for Computer Products and Services" as well as information on your publications in the countries I have checked.

☐ Germany ☐ United Kingdom ☐ Italy ☐ Brazil
☐ France ☐ United States ☐ Japan

Name_____
Title_____
Company_____
Address_____

POSITION ANNOUNCEMENTS

OPERATIONS MANAGERS

interested in making

$30–60,000

as a

SOFTWARE SALESMAN

If you:

- Have a record of success in the IBM 370 environment
- are personable, aggressive, and a self starter
- are willing to relocate

Send your resume, or better yet pick up the phone and call Bob McIntosh at

JOHNSON SYSTEMS

8400 Westpark Drive, McLean, Virginia
703-893-8700

PROGRAMMER/ANALYSTS

WE OFFER THE CHANCE OF A LIFETIME

To Medium Experienced Programmers

Equitable General Insurance Group is one of the fastest growing property and casualty companies in the country today whose employees have recently moved to a new and beautiful nine-story home office building. We need talented programmers and programmer/analysts with 1 to 2 years experience in a COBOL environment using OS/JCL, or applicants with experience in the property/casualty insurance industry.

If you want the opportunity to work in a highly state-of-the-art IBM 370/OS/MVS/IMS environment and if you feel you are ready to advance and be recognized for your contributions, we would sincerely be interested in telling you about our company.

We can and will offer Premium Salary Incentive to all qualified candidates. Plus, we offer you an excellent growth opportunity which can be demonstrated based on our past experiences and future goals.

Equitable General Insurance Group, a subsidiary of the third largest life insurance company in the world, provides one of the most liberal benefit programs in the industry including group insurance, retirement and investment plans and paid vacation and holidays.

You have everything to gain and nothing to lose.

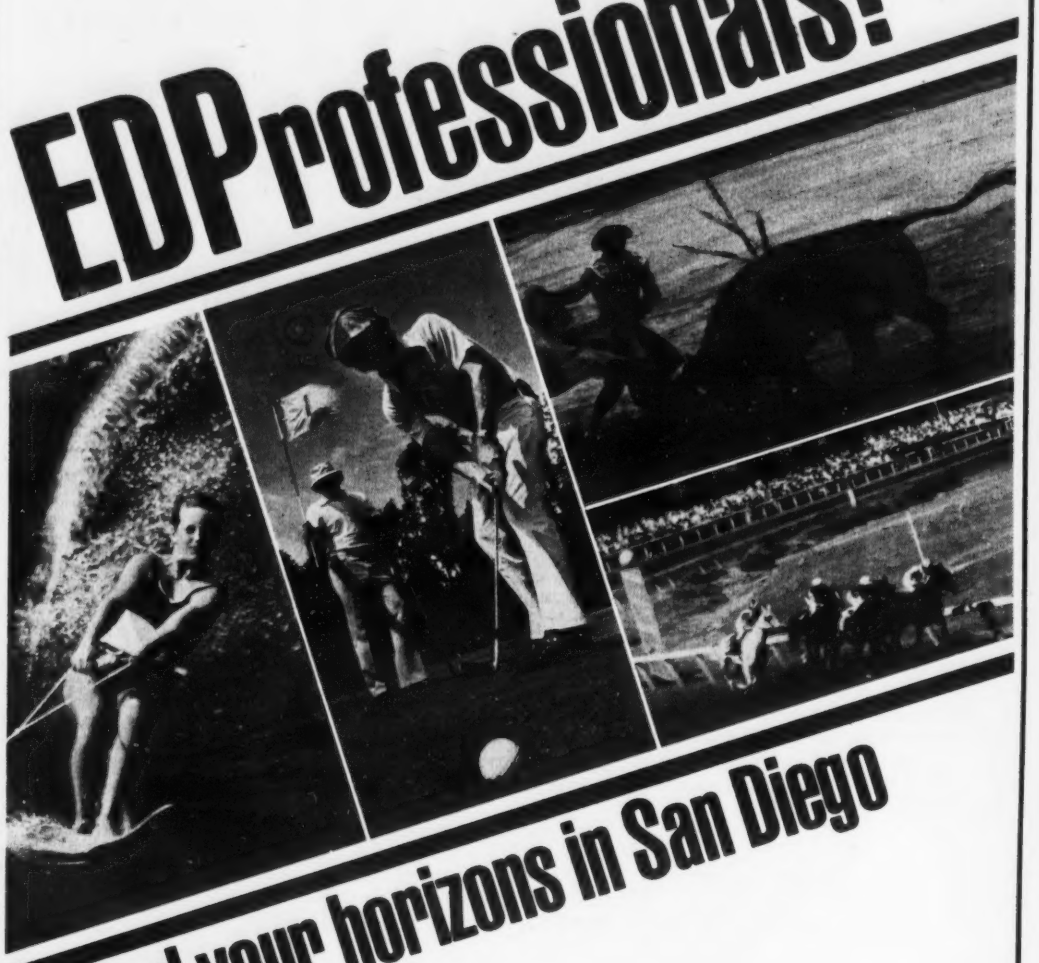
For further details call Gary Penn toll free at 1-800-433-1560. If in Texas call 1-800-792-1060.

Or send resume to

EQUITABLE
GENERAL INSURANCE GROUP
One Equitable General Place, Fort Worth, Texas 76151

A SUBSIDIARY OF THE EQUITABLE LIFE ASSURANCE SOCIETY OF THE UNITED STATES
An Equal Opportunity Employer M/F/H

EDProfessionals!



Expand your horizons in San Diego

Immediate openings—software

- **SOFTWARE DESIGN SPECIALIST** With experience in one or more of the following areas: teleprocessing, system architecture, network processing, transaction processing. Participate in design and application of an advanced communications network architecture to meet distributive processing needs of the 1980s.
- **TEST SYSTEMS DEVELOPMENT** Specify, design or evaluate and recommend test systems to support manufacturing digital and analog test requirements. Evaluate current test philosophies, review testability of new product designs and propose product test plans. Requires Electrical Engineering or Computer Science education, thorough knowledge of computer architecture, logic design experience and demonstrated firmware proficiency.
- **FIRMWARE**
- **DIAGNOSTIC PROGRAMMING** Design, develop programs to support software testing, release and repair.
- **SOFTWARE DEVELOPMENT** Design/implementation of multi-program O/S in a high-level language. Experience desired in data base or telecommunications, distributive processing, virtual machine, time-sharing compilers.
- **MIS APPLICATIONS**
- **SOFTWARE QUALITY ASSURANCE**
- **OPERATING SYSTEMS (HIGH-LEVEL LANGUAGES)**
  —File management Project Lead
  —Data communications
- **DATA BASE**
  —Project Lead
  —COBOL
- **TRANSACTION PROCESSING**
  —Project Lead
- **SYSTEMS MEASUREMENT**

Employees will enjoy excellent salary and top working conditions with a commercial employer. Fully paid life, hospital and medical plan for employee and dependents. Please send resume, including salary history and experience, to the Professional Placement Office at the address below:

NCR ENGINEERING AND MANUFACTURING
16575 W. Bernardo Drive, San Diego, Calif. 92127
An equal opportunity employer

PROGRAMMERS

For the most individualized job search offered in the Data Processing field today, on a local or national level. Send resume to:

SEARCH E.D.P., INC.
Personnel Consultants
13773 N. Central Expwy.
Suite 1305
Dallas, TX 75243

ALL FEES PAID BY EMPLOYER

PROGRAMMERS AND ANALYSTS

Free Employment Service

Northeast, Southeast & Midwest U.S.

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees.

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
Cherry Hill, New Jersey 08002
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 300, Dublin Hall
1777 Walton Road
Blue Bell, Penna. 19422
(215) 629-0595

RSVP SERVICES
Employment Agency for Computer Professionals

position announcements | position announcements | position announcements | position announcements | position announcements

Can You Train Computer Salespeople?

Digital's minicomputer sales training programs are noted for their professionalism and accomplishments. Emphasis is palced on a training staff that has "practiced what it preaches." The minicomputer sales training and specialists at Digital must be highly-motivated and excellent communicators who have successful direct experience in the technical and applications areas they will be propounding.

Sales Training Specialist

This individual will beocme a key member of the training team that teaches the Digital sales force features, benefits, trade-offs and configuration guidelines for Digital minicomputers. Working with all of the Digital minicomputer product groups, you will become an expert on the existent parameters, as well as be privy to new and state-of-the-art Digital developments. To qualify for this ultra-rewarding position, you must have technical computer background, particularly in the software and systems areas. Super communications skills and enthusiasm are musts. Prior training experience is a plus. We will complement your current capabilities with an extensive training program about Digital and Digital products.

Please forward your resume, including salary history, to Mr. Barry Bograd, A 71 PK 3-1, 129 Parker Street, Maynard, Massachusetts 01754. We are an equal opportunity employer m/f.

digital

The ROMAC DIFFERENCE

We Never Pass Out A Laundry List

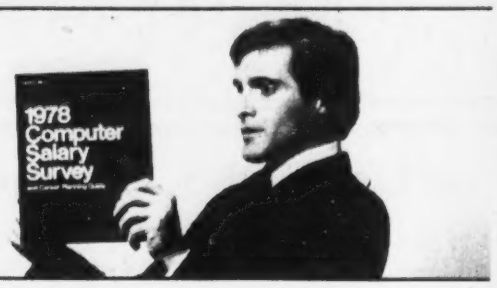
Romac policy forbids using the "Laundry List Technique." Other personnel consultants send out huge lists of names to prospective employers, we never do. Romac supplies its clients with only the best qualified professionals.

No professicnal wants his career bunched with countless other more or less qualified candidates. He wants special attention and consideration from his personnel consultant. The Romac Partners see to it that he gets it. That's the Romac Difference.

ROMAC
& ASSOCIATES/
Personnel Consultants

Contact Romac & Associates, A. L. Lemay, President; 2 Sun Life Executive Park, Wellesley Hills, MA 02181 for transmission to our Partners in Atlanta, Boston, Buffalo, Charlotte, Hartford, New Haven, New York, Philadelphia, Portland, Rhode Island, Rochester/Syracuse, Stamford.

1978 Computer Salary Survey!



Call for your Free copy today!

Are you making the kind of money you should be making? Inflation and record demand have pushed salaries in the computer field to all time highs. Source Edp's *1978 Computer Salary Survey and Career Planning Guide* lets you know whether you're keeping pace.

This comprehensive free report also gives you expert advice on a variety of important career topics such as: when you should consider a job change; what you need to do to break into management; how to make sure you're getting the proper exposure; why timing is so crucial in your long range career development; how you can avoid stagnation . . . and much more.

The *1978 Computer Salary Survey* has been compiled by Source Edp, the largest recruiting firm devoted exclusively to the computer profession in North America. It's must reading if you're concerned about your career. But call now, it could be one of the most important career decisions you've ever made.

For your Free copy, call the Source Edp office nearest you.

East:
Boston 617/482-7613
Wellesley MA 617/237-3120
Hartford 203/522-6590
New York City 212/736-7445
Philadelphia 215/665-1717
Stamford CT 203/329-8411
Union NJ 201/687-8700
Washington DC 703/790-5610

Midwest:
Chicago 312/782-0857
Cleveland 216/771-2070
Detroit 313/963-0510
Kansas City 816/474-3393
Milwaukee 414/277-0345
Minneapolis 612/544-3600
Northfield IL 312/446-8395
Oak Brook IL 312/986-0422
Pittsburgh 412/261-6540
Rolling Meadows IL 312/392-0244
Southfield MI 313/352-6520
St. Louis 314/862-3800
St. Paul 612/771-0544

South/Southwest:
Atlanta 404/325-8370
Dallas 214/387-1600
Denver 303/773-3700
Fort Worth 817/338-9300
Houston 713/626-8705
New Orleans 504/561-6000

West Coast:
Encino CA 213/995-8866
Irvine CA 714/833-1730
Los Angeles 213/386-5500
Palo Alto 415/328-7155
San Diego 714/231-1900
San Francisco 415/434-2410
Seattle 206/454-6400
Torrance CA 213/540-7500

Canada:
Toronto 416/364-2919

source edp

If unable to call, write: Source Edp, Department C
721 Enterprise Drive, Oak Brook, Illinois 60521

(When writing, please be sure to use home address and indicate position title.)

INFORMATION SYSTEMS SYSTEMS ANALYST

Postion now available for a Systems Analyst with COBOL programming experience.

A BS degree with 2 years of Systems Analysis and at least 2 years of COBOL programming is required. Background in on-line manufacturing control applications such as BOM, MRP and financial systems a definite plus. Data base design will be helpful.

The Microelectronics Division of NCR is one of the leaders in MOS/LSI technology. If you are a self-motivated professional and believe you qualify, send your resume to:

NCR

Mr. T.F. Wade, Manager
Personnel Resources
Microelectronics - Miamisburg
NCR Corporation
8181 Byers Road
Miamisburg, Ohio 45342

An Equal Opportunity Employer

WHAT IS YOUR TRUE WORTH?

It's a seller's market for EDP professionals ... you are the seller.
Because of this you should take a "hard look" at what your present position offers you ... salary, advancement, etc.
We offer assistance in evaluating your present position. Just send us your resume, or a note outlining your experience, no obligation to you ... we will call you to discuss your objectives with you.

Prog/Analysts	**$18-22**	**Mgrs S/3 RPG-11**	**$16-23**
Sys Analysts	**$20-25**	**Programmers**	**$15-22**
Sr Anal/Proj Mgrs	**$22-30**	**EDP Auditors**	**$18-22**
Tech Sup/Sys Prog	**$20-30**	**Sci/Mini Prog**	**$16-23**

For more information on our NATIONWIDE — FEE PAID — CONFIDENTIAL placement service contact, or send your resume to:

Mark Fuller
CADILLAC ASSOCIATES, INC.
32 W. Randolph St., Chicago, IL 60601 312/346-9400

DATA PROCESSING PROFESSIONALS

We offer a ground-floor opportunity for talented information-processing professionals to grow with a rapidly expanding university computing center. One of the nation's most prestigious colleges has openings for several Information Processing professionals to take part in the design and implementation of a comprehensive on-line administrative information system. This administrative system will be implemented in Data Base using the latest state-of-the-art computer systems. All activities will be carried out in an environment which encourages creative thinking. If you are ready to accept a challenging and responsible position we invite you to explore these openings:

ANALYST/PROGRAMMERS

Responsible for performing systems analysis and programming assignments with a minimum of technical supervision; interpreting user needs and developing and implementing programs to meet those needs; capable of analyzing and resolving problems quickly and accurately. Position requires programming experience in financial, educational, or data base systems using ANS-COBOL. Familiarity with on-line environment and experience in administrative college environment are desirable.

SUPERVISOR I/O CONTROL (Quality Control)

Responsible for establishing operational I/O control section performing user request interpretation, data preparation, job setup and submission, and output review (quality control). Individual should be well versed in I/O control procedures and be highly user-service oriented. Bachelor's degree required; advanced degree preferred.

Salaries competitive & commensurate with experience. Exc. fringe benefits, including 20+ days annual vacation. For prompt consideration please mail resume including salary history or call Sy Fischthal at (212) 520-7264 to schedule interview.
Mr Sy Fischthal, Director, Information Systems, Queens College, Jefferson Hall, Rm. 106, 65-30 Kissena Blvd., Flushing, N.Y. 11367. *An Equal Opportunity/ Affirmative Action Employer.*

Come to Coastal S. Carolina

Manufacturing PROGRAMMER/ANALYST

The Robert Bosch Corporation, an international pioneer in manufacturing diesel fuel injection products, has an immediate opening for a Programmer/Analyst.

The successful candidate should have a B.S. degree or equivalent with 3-5 years manufacturing systems experience in the following areas: Cost Accounting; Inventory Control; Requirements planning; shop flow control, and capacity planning.

Knowledge of DOS/VS, COBOL, ALC, and DBOMP a must.

Duties will be in the design and installation of various manufacturing systems.

You will be living in a warm coastal city and working in a modern sophisticated setting that offers excellent technical development opportunities.

We offer excellent wages and a fringe benefit package that includes Life insurance; short aid long term disability, hospital, medical and dental insurance, 10 paid holidays, paid vacation and sick leave, educational assistance, company paid retirement plan, credit union and relocation expenses.

If you have a proven track record and desire to move south, send your resume in confidence to:

Robert Bosch Corporation
P.O. Box 10347
Charleston, S.C. 29411
AN EQUAL OPPORTUNITY EMPLOYER

position announcements | position announcements | position announcements | position announcements | position announcements

E.D.P. PROFESSIONALS

If you are a programmer, programmer analyst or systems analyst and would like the most individualized job search offered in the data processing field today, either on a local or national level, send your resume in confidence to:

AFFIRMATIVE ACTION FOR PROFESSIONAL WOMEN, INC.
P.O. BOX 1301
SARASOTA, FLORIDA 33578

"WE AGGRESSIVELY SUPPORT AFFIRMATIVE ACTION"

DIRECTOR SYSTEMS MANAGEMENT

We have an immediate opening for exceptional individual to assume responsibility for the Systems Management Department in a 620-bed, acute care hospital. Involves planning, designing and updating of existing business and clinical computer systems. The successful candidate must have management experience in a data processing environment, proven technical competence and the ability to communicate effectively with administrative and medical personnel. Hospital experience and a college degree are desirable but not required. Starting salary in mide 20's. Please send resume including salary history in confidence to:

Darrell M. Walters
Employment Mgr
St. Luke's Methodist Hospital
1026 A Ave. NE.
Cedar Rapids, Iowa 52402

SHENANDOAH VALLEY OF VIRGINIA

Maintenance programming on Univac 1108 message switching system. Two years real-time experience required. Beautiful rural location between the Blue Ridge and Appalachian Mountains. Skiing, hunting, fishing and canoeing only minutes away, yet only 90 miles from Washington, D.C. Salary $16,400 - $25,900. Send resume in confidence to:

J.A. Manning, Dir.
Western Union Telegraph Co.
P.O. Box 186
Middletown, VA 22657
(703) 869-1500
Equal Opportunity Employer M/F

POSITIONS NATIONWIDE

CALL TOLL FREE
800-426-0342

SOFT PROGS .....To 30K
2-4 yrs. exp. with OS Sysgens, MVS Internals and Vendor Software Packages.
COMM PROGS .....To 25K
3-5 yrs. exp. with CICS, BTAM, TCAM and Related Software.
PROGRAMMERS .....To 24K
Need several with all types of industry backgrounds. Openings are nationwide.
SOFT. RESEARCH ..... to 30K
Advanced degree in CS with exp in LISP, SNOBOL, PASCAL, PL/1 and BAL background.
MKTG. MGRS. .....To 41K
Broad Marketing Management experience in Business Data Processing. Degree required.

PARKER PAGE ASSOC.
P.O. Box 12308
Seattle, WA 98111
Offices in Wash., D.C., Chicago, Atlanta, Portland, Or.

OVERSEAS ADVENTURE $40K+

IRAN

Applications programmer, Systems Engineer, H-6000 or L/66, GCOS/COBOL/GMAP IDS TPE/MULTICS, US firm has 18-24 mo tours w/fam. Ex financial pkg in Tehran. Ski 1 hr fm office. Rush resume: Cybermetrics Corp., P.O. Box 579, McLean, VA 22101. (703) 356-1997. Other positions avail. USA and Iran

PROGRAMMER/ ANALYST

(Instructional Specilist)

Must have work experience in COBOL, FORTRAN, and BASIC languages. Must have a Bachelor's degree in computer science, prefer work experience in educational environment. Equal Opportunity Employer.

Contact: Macomb County Community College, Personnel Office: 14500 Twelve Mile Rd., Warren, MI 48093 (313) 779-7311.

EDP AUDITOR

Individual experienced in computer programming, operations and system analysis to perform audits in a dynamic EDP environment (IBM-370's). Opportunity to work in internal audit department, which offers advancement to management positions. Bachelor's degree required, M.B.A. preferred. Willing to travel.

Send resume and salary requirements, by May 1, 1978, to:

Personnel Administrator
United Nuclear Corporation
7700 Leesburg Pike
Falls Church, Va. 22043
UNC is an equal opportunity employer

MIAMI, FLORIDA *PROGRAMMER ANALYST*

This is your opportunity to join one of Florida's leading retailers.

Due to our continued expansion we are seeking individuals with heavy experience in Cobol and/or Neat/3. Strong plus factors include Online Systems, Cincom Total Data Base, Retail Systems preferred.

We offer excellent opportunity for personal and professional growth potential. Top salary and full benefit package (relocation expense included).

If you feel that you qualify please call collect, Mr. D. Messer, Director of Personnel (305) 625-2681 or send resume including salary history to:

JByrons
15600 N.W. 15th Ave.
Miami, Florida 33169
Equal Opportunity Employer

GTE

NEW TECHNOLOGY IS CHANGING THE WAY THE WORLD COMMUNICATES...

GTE

Join the team that's making it happen!!

CALL TOLL FREE
(800) 323-1966
In Illinois (800) 942-0491
Monday thru Friday from 8am to 5pm cst

The future is happening NOW at GTE Automatic Electric Laboratories, and its happening in a big way. We're working on new techniques and systems that will drastically change the telephony control and transmission process in the decades ahead. If you would like to be one of the contributors to a new era in computer application, and a new level of the telecommunications science, talk with us.

APPLIED RESEARCH

Performs research on circuits, systems and subsystems and related hardware and software in order to provide management with information on concept feasibility and estimated system cost for design and development. Efforts involve providing existing services with new techniques and/or new services on existing equipment.

LONG RANGE PLANNING

Long Range Planning activities involve research studies on a wide variety of subjects related to the telephone communications industry. These studies include such areas as data communications, new technology, new services, future switching networks, evaluation of new switching techniques and review of the impact of political, economic and regulatory considerations. Intent is to provide well founded counsel and recommendations to upper management on future development programs and courses of action.

SYSTEMS DESIGN

New Feature Design—Plan and develop the future hardware and software evolution of current large scale fully stored program controlled switching systems. Develop new features for existing equipment, study new features impact on existing systems, and estimate the development costs and requirements.

Product Design—Design advanced fully stored program controlled systems for telecommunication application. Develop large scale software programs in an on-line, real-time environment and related digital hardware using CMOS, Shottkey, TTL as well as Static and Dynamic MOS.

International Design—Develop design philosophy and Architecture Definition of switching systems for international markets. This involves high level design structure development and detailed studies of critical problem areas. Define specific design implementation tasks, review progress and coordinate developments with implementation teams abroad.

SOFTWARE DESIGN

Data Base Software—Responsible for logical and physical data base design and implementation related to telecommunications systems. Develop programs which automate the generation of data base contents for these systems in an IBM 370 environment using PL/1.

Support Software—Involved in compiler, assembler, simulator maintenance and enhancement as well as other IBM 370 software developments. Support effort is related to micro and large processor developments.

Application Software—Large scale development in telephone system real-time control. Diagnostic and fault recognition software, administrative software involving real-time data base administration, switch and network overload procedures as well as executive software.

SYSTEMS CONTROL AND TESTING

Development and execution of comprehensive test plans to evaluate the performance of large stored program switching system prototypes. Execute configuration management on all hardware, software, and components and maintain project control for all activities. System evaluation performed on both laboratory prototypes and initial field site locations.

If you have in-depth expertise in one or more of these areas, and a BS, MS, or PhD in Electrical Engineering, Computer Science, Math or other appropriate engineering discipline as well as an interest in moving forward with challenging new frontier in computer technology, talk with us.

If unable to call send resume including recent salary history to:

Manager of Technical Employment
Dept. 471 A8

GTE **AUTOMATIC ELECTRIC LABORATORIES**

400 N. Wolf Road
Northlake, IL 60164

An Equal Opportunity Employer M/F

MAKE THE SWITCH

HARRIS

The Expanding Force in Distributed Data Processing

Harris Data Communications, a leading supplier of distributed data processing systems and services, is one of 16 high-technology divisions that have made parent Harris Corporation a $650 million leader in communications, information systems, government systems, semiconductors and printing equipment. Our comprehensive family of advanced products also encompasses multi-function remote batch terminals and intelligent interactive terminals, giving us the broadest range of data communications products and services in the industry.

The focal point of Harris' long-term commitment to the distributed data processing marketplace is in DALLAS, the heart of the growing NORTH TEXAS METROPLEX, where we currently are completing construction of our new $7 million, 240,000 square foot headquarters facility. Career opportunities in DALLAS are aimed at meeting the many challenges facing us as we design new systems, hardware and software, to meet our customers' needs . . . today and tomorrow.

SOFTWARE DEVELOPMENT

Systems Software Development—Immediate opportunities available for Software Development Professionals in a broad range of disciplines at all experience levels. Preferred background should include experience in design and implementation in the following areas:

- Operating Systems
- File Systems
- Data Based Management Systems
- Compilers and Assemblers
- Linkage Editors
- System Utilities
- Data Communications Systems
- Online, Interactive Systems
- Hardware Diagnostics
- Virtual Systems
- I/O Drivers
- Distributed Processing Systems
- Remote Batch Terminals

B.S. or M.S. in Computer Science or related field and Assembly language experience required. Development experience on minicomputer or microprocessor systems and familiarity with structured design and programming techniques preferred.

Analysts

Degree and experience in Assembly language programming on minicomputers, preferably in communications. Responsibilities include providing ongoing support for locally developed programs on Harris equipment that spans all functional areas, interacting with customers and designing and developing new programs as required.

HARDWARE DEVELOPMENT

Systems Engineer

Responsibilities will include architecture studies and hardware/software tradeoffs during the specification phase of development projects, performance measurement and analysis on existing systems and scheduling and implementing cost effective system designs and specifications. Requires BSEE (MSEE desired), working familiarity with both hardware and software, and 3 or more years related experience.

We offer excellent starting salaries, the stimulation of working in a highly professional environment, and a company aiming at excellence in its industry. Our comprehensive benefits include Health, Life and Disability insurance, a stock purchase plan, a tuition assistance program, and a retirement plan.

For prompt consideration, please send resume including salary history and requirements to: GARY SIEGEL, Harris Corporation, Data Communications Division, P.O. Box 44076, Dallas, TX 75234.

LOOK AT HARRIS NOW... for career opportunities with challenge

HARRIS
COMMUNICATIONS AND INFORMATION HANDLING

An Equal Opportunity Employer Male and Female

Systems Programmers And Analysts

Sperry Univac's national accounts organization has immediate openings for experienced systems programmers/analysts at various locations throughout the U.S.A. We offer a comprehensive training program including both classroom and on-the-job training on our 1100/80 large scale multi-processor system. This is an excellent opportunity to expand your data processing experience in a multi-faceted environment.

Applicants should have operating systems experience on any large-scale computer system, system generation and implementation procedures, installation of diversified applications, and a minimum of 2 years assembly programming and some high level languages would be desirable.

We offer an outstanding benefits program plus relocation expenses. For prompt consideration please send your resume to Charles Sigg, Sperry Univac, Mail Station B-214, P.O. Box 500, Blue Bell, PA 19424.

SPERRY UNIVAC COMPUTER SYSTEMS

An equal opportunity employer M/F

SYSTEMS PROGRAMMERS

YOU MAY NOT WIN AN OSCAR FOR PRODUCING OUR "NETWORK" BUT...

THE REWARDS WILL STILL BE THERE

· WHAT REWARDS ?

You'll be involved in the development of a worldwide computer network which will connect data centers in New York, Pennsylvania, the United Kingdom, France and Australia. Some international travel may be required.

The working environment is a new data center located in one of the most picturesque settings imaginable. Located high on a hill your view will scan miles of untouched natural beauty typical of the Finger Lakes region in Western New York State,

The community is in the heart of New Yorks southern tier, a land in which peaceful river valleys contrast with the rugged hills that rise above them, the pleasant aspects of smalltown life are combined with many cultural benefits found only in metropolitan areas, within a one hour drive from Corning, you will find the Finger Lakes, Watkins Glen, skiing and wine country.

How Can You Qualify?
Send Us Your Resume!

We are looking for all levels of systems programmers, 2-10 years of experience with IBM operating systems and telecommunications software internals, MVS, TSO large RJE or computer networks exposure would certainly be a plus.

Bill Ray
System Software Administrator
Corning Glass Works
Corning, New York 14830
An Equal Opportunity Employer

ASSISTANT DIRECTOR, USER SERVICES

Salary negotiable in 20's

The Computing Services Office of the University of Illinois operates one of the largest and most diverse facilities anywhere for the support of Research and Instructional computing. Serving a student body of 35,000 with one of the nations outstanding research programs offers a challenging opportunity for an experienced and creative person, and an ideal step for the ambitious.

The Assistant Director, User Services is responsible for all aspects of presenting a coherent service to users of the center through a professional consulting staff as well as other supporting activities such as documentation and user accounting. The staff presently consists of 11 full time computer professionals and six others. The position reports to the Director.

CSO operates two major computing systems with a large network of remote facilities and terminals, we well as being interconnected to other computers on campus, and national networks.

Applicants for this position should have a proven record of dealing with large systems, sophisticated users and diverse services.

To be fully considered for this position forward resume by May 15, 1978

TO: George F. Badger, Jr., Director, Computing Services Office, 150 Digital Computer Lab.

University of Illinois
Urbana, Illinois 61801
The University of Illinois is an Equal Opportunity/Affirmative Action Employer

EDP SPECIALISTS

Nationwide

- **Retail MIS Dir** To $50M
  West Coast location
- **POS Proj Mgr** To $30M
  Chicago location
- **DB Admin DMS 2** To $28M
  Missouri location
- **Operations Mgr OS** To $28M
  Houston location

Fees assumed by Client Companies

Fees assumed by client co's.

LESLIE KAVANAGH
505 5th Av, NY, NY 10017
(212) 661-0670 (agency)

FINANCIAL SYSTEMS ANALYST

Needed to assist Management Information Systems Manager at Corporate Headquarters in Virginia, outside Washington, D.C.

Requires 2-3 years experience in COBOL programming on IBM/370 and a Master's degree in business, finance, or accounting. (Undergrad degree in engineering or physical sciences is preferred).

Responsible for financial systems analysis, design and modeling as well as in-house customer liaison. Some travel to hardware installations (Connecticut and New Mexico) required.

Position provides opportunity for growth. Excellent company-paid benefits including dental plan are provided.

UNC is diversified and growing, the Nation's largest independent producer of uranium.

If you are interested, and qualified, please send complete resume and salary requirements to:

M. Neyhard
Personnel Administrator

UNC UNITED NUCLEAR CORPORATION
UNC Crescent Plaza
7700 Leesburg Pike
Falls Church, Virginia 22043

Equal Employment Opportunity is our pledge and our practice

Minicomputer Specialists: TI's got a home for you where everybody wants to live: Austin, Texas

Austin is where Texas Instruments is making big news in micro/minicomputer technology.

You know about Magnetic Bubble Memory. Did you know that TI is making the world's first commercial applications of MBM in its new 763/765 portable terminals?

TI is using its world leadership in semiconductor technology to pioneer distributed computing networks.

You don't get backwatered here. You're in the mainstream of micro/minicomputer technology. It's one of the three major thrusts of the entire corporation.

Career-wise, you won't find a better place than Texas Instruments.

Any-other-wise, you won't find a better place than Austin, Texas.

Everybody wants to live in Austin. No wonder.

Austin is one of the 14 "most pleasant" cities in the United States—or one of the 12 "most livable"—depending on which national magazine you read.

Austin also is generally acknowledged to be the most cosmopolitan of all the state capitals and the most beautiful city in the Southwest.

Austin's biggest school—the University of Texas—is ranked academically as one of the top three universities in the South. (Its MBA program is ranked among the top 10 in the nation.)

The city's cost of living is lower than that of any other city surveyed by the Bureau of Labor Statistics. (Believe it or not, Austin's city and school taxes went *down* in 1977.) And in the state of Texas, you pay no state income tax.

People all over are trying to dream up excuses for moving to Austin. Lucky you. You're a minicomputer specailist. *Austin is looking for you.*

We want to hear from people qualified for the following positions.

Atlanta Interviews:

Design Engineers
Experience in memory or microprocessor systems design with 1-5 years' experience and a BSEE or equivalent. Opportunities in peripheral interfaces, disc controllers, bubble memory controllers, advanced systems controllers, and multimicroprocessor computers.

Production Test Engineer
Design, development and support of sophisticated test equipment and requirements for new minicomputer and terminal products. BSEE with 1-10 years' experience in computer logic design, checkout or test software experience desirable.

Product Service Engineer
Support new computer products from conception to field maturity with a BSEE and 2 or more years' in design or sustaining of minicomputers/peripherals.

Reliability Engineer
Perform detail stress analysis, reliability predictions, and life testing of new minicomputer products with 1-4 years' experience and BSEE.

Product Marketing Engineer
Support field engineering, analyze customer systems applications, competitive market analysis, and market planning/execution with an MBA and undergraduate technical degree with 1-5 years' computer experience.

Marketing Analyst
Responsibilities through marketing for software products including research, competitive analysis, and coordination with software development. Must have a CS degree.

Product Marketing Planning Manager
Responsible for long-range planning of computer and systems products, market segment definition, market share studies for minicomputers. 5-7 years' experience in computer marketing.

Audit Analyst
Individual selected for these positions will conduct in-depth technical analysis of new software products and product development for quality and usability.

Software Support Programmer
Duties will require maintenance of existing software packages and assist in our nationwide field operation.

Systems Development Programmer
Opportunities on a new project of multimicroprocessor products using the latest memory architecture. Opportunities also include design of new operating systems for follow-on products.

Applications Programmer
Project member for commercial, industrial or business systems departments having direct contact with customers doing software product development.

Diagnostics Programmer
Design/development of intensive unit/systems level diagnostic software for 990 computers in a standalone and real-time environment.

Business Programmer
Design new systems with COBOL to satisfy the needs of a small business computer user.

Applicants for these programming positions must possess a background in one or more of the following areas: microprocessors, operating systems, distributive processing networks, assembly and higher level languages. Requirements also include ability to communicate effectively, desire to work with customers, and a BS in CS, EE or Math.

Technical Instructors
Good communicator desiring to teach customers/field personnel in latest hardware/software products. Technical background with master's and teaching experience desired.

Project Leader
Responsibilities include supervision of engineers/technicians on projects related to bubble memory, advanced displays. Requires 4-7 years' minicomputer leadership experience.

Atlanta Interviews
Wed., Thurs., & Fri., May 10, 11 & 12.
Call Lee Cooke at (404) 892-6856 from 9AM to 8PM Wed. or Thurs., or from 9AM to 3PM Fri.
To arrange an interview in advance, call Lee Cooke at (512) 258-7242.

If unable to arrange an interview on these dates, send your resume in confidence to: Lee Cooke/P.O. Box 2909, M.S. 2106, Dept. 8399/Austin, TX 78769.

TEXAS INSTRUMENTS
INCORPORATED

An equal opportunity employer M/F

West

Los Angeles Area
San Francisco Bay Area
Seattle
Denver
Kansas City
Minneapolis/ St. Paul
Chicago
St. Louis
San Antonio
Houston
Dallas
Milwaukee

"Had it" with those ordinary sales jobs?

Good. You're ready for Tektronix.

Our present growth has been brought about by professionals like yourself, people who have been trained to do a good job; you like the sales field and want to progress. At Tektronix you'll have the best product in the marketplace to represent AND have complete management and sales support. We say 'complete' support and we mean it. Our sales staff is very important to us, as are all of our people. That's why we attract, and keep, the best professional sales staff in the industry.

That's where you come in. If you have the training and ability, but need a company where you can really put them to work, knowing you'll have support when and where you need it, then you're ready for a Tektronix career. You'll be representing the undisputed leader in computer graphic terminals and computer graphic systems: From manufacturing to marketing to servicing. Our growth has created openings in major metropolitan areas across the nation for the following:

District Sales Managers
OEM Sales Engineers
Sales Engineers
Systems Analysts

Let's get together—NOW.

(800) 227-8340 Outside California
(800) 638-1915 Inside California

If you are ready to put your talents to work, let's hear from you. Forward your resume or summary sheet or call one of the above TOLL FREE numbers, listing your area of preference. Address your inquiry to Tod Sorensen, TEKTRONIX, INC., 3200 Coronado Drive, Santa Clara, California 95051. An equal opportunity employer m/f/h.

Coming to National Computer Conference? Call us now, let us know when and where you'll be and we'll schedule and interview at your convenience.

Tektronix®
COMMITTED TO EXCELLENCE

East

Rochester, N.Y.
Syracuse, N.Y.
Philadelphia
Charleston, W.VA
Richmond, VA.
Baltimore
Washington, D.C.
Detroit
Boston
Rhode Island
Woodbridge, N.J.
New York, N.Y.
Cleveland
Atlanta
Orlando
Memphis
Louisville
Columbia, S.C.
Birmingham

CENTRAL WASHINGTON UNIVERSITY
Computer Center
SYSTEMS ANALYST/ PROGRAMMERS

CWU has openings for two System Analyst/Programmer II's and one Systems Analyst/Programmer I position with major responsibilities in the development of new applications software utilizing extended basic on a PDP 11/45 supporting 30 terminals and OS COBOL on a remote AMDAHL 470/V6 support site.

CWU is a pioneer in large scale networking and local interactive mini support for on-line student registration.

Minimum qualifications for the SA/P II positions are one year experience in programming and analysis or a Bachelor's degree in job related area. The SA/P I position requires High School graduation or GED and proficiency in COBOL or Basic-plus.

Applications must be postmarked by May 19, 1978. For application and further information contact Donald Clark, Director of Computer Services, Central Washington University, Ellensburg, WA 98926, or call (509) 963-2921. EEO/AA/TITLE IX Institution.

APPLICATIONS PROGRAMMER/ANALYST
The College of Wooster

Small computer installation in a very desirable educational environment.

One year COBOL experience with large scale equipment such as CDC, CYBER 73 and 6500 required.

Responsibilities include learning administrative operations; design, implement, and document new applications; some maintenance programming. Excellent employee benefits and salary commensurate with qualifications and experience.

Send a letter and complete resume to:

Dept. of Personnel
The College of Wooster
Wooster, Ohio 44691

Applications should be received no later than May 31, 1978. Affirmative Action, Equal Opportunity Employer.

SYSTEMS PROGRAMMER

Immediate opening for experienced DOS-CICS systems programmer. Responsibilities include implementation and network management of a leading edge, on-line teleprocessing system for a progressive trucking company headquartered in Southwestern Ohio. Excellent career opportunity for capable, personable individual. Attractive starting salary and benefit program. Forward resume and salary history for consideration. **Reply to: CW Box 1547, 797 Washington St., Newton, Ma. 02160**

An Equal Opportunity Employer

PROGRAMMERS • SYSTEMS ANALYSTS
SOFTWARE SPECIALISTS • IBM • HONEYWELL
DEC • COBOL • ASSEMBLER • RPG

Major U.S. Companies Want To Interview You.

Major U.S. companies will be Dallas and Houston to interview computer professionals for HUNDREDS OF POSITIONS Nationwide in the $14,000 to $28,500+ salary range. These key positions could be filled by invited candidates attending the CAREER ADVANCEMENT CONFERENCE sponsored by Control Data Cybersearch.*

If you have solid data processing experience, you won't want to miss this outstanding career opportunity. Find the job that's right for you, at the salary you want, with the companies you want to interview. All at ONE location. NO COST. NO CONTRACT. NO OBLIGATION to you now or upon hire.

To participate, you MUST register. Call Cybersearch any weekday 9 A.M. to 7 P.M. Out-of-towners call collect. For reasons of confidentiality, if your current employer is an attending company, we will notify you immediately.

Those out-of-town candidates who are invited by Cybersearch will be reimbursed for reasonable transportation expenses.

Call or write conference coordinator at office nearest to you.

CONTROL DATA CYBERSEARCH INC.
a subsidiary of CONTROL DATA CORPORATION

8585 Stemmons Freeway, Dallas, TX 75247 214/688-5810
2000 West Loop South, Houston, TX 77027 713/965-5666

SIGMATICS

Honeywell Programmers

Attention!

Exciting contracting opportunities for experienced programmer/ analysts:

* **COBOL-Level 66, 6000, & or 600**
* **IDS & COBOL all Levels**
* **GRTS NPS all Levels**
* **GCOS or GeCOS (software or tech support)**
* **Development and commercial assignments**
* **Short or long term**

Contact nearest branch office: (714) 833-1143; Irvine, CA; (404) 953-1220, Atlanta, GA; (214) 251-1611, Irving, TX; (602) 266-0466, Phoenix, AZ; (408) 246-8940, San Jose, CA.

equal opportunity, consulting firm

PROGRAMMER

Large Center City Commercial Bank needs a Programmer with experience in NCR NEAT III levels 1 and 2. Banking for financial background necessary. Familiarity with on-line programming and knowledge of NCR's CIF is desirable. You will be responsible for installation of CIF system in correspondence banks. Good communication skills with people are necessary. Rapid growth and advancement for the ambitious individual with the required experience. Excellent starting salary and benefits package. Send resume including salary history and requirements to:

PERSONNEL DIVISION
PROVIDENT NATIONAL BANK
Post Office Box 7648
Philadelphia, PA. 19101

Equal Opportunity Employer M/F

PROGRAMMERS AND SYSTEMS ANALYSTS

Put Your Experience To Work For You In Building A Better Career Opportunity

Sperry Univac has a variety of challenging opportunities waiting for you at one of our Minneapolis locations. These openings exist within our Airline Industry Development Center which designs and supports software applications such as reservations, ticketing, cargo, departure control, message switching, check-in, hotel and fare quote. We are searching for candidates with 2 to 8 years experience in the following disciplines:

* Design, implementation and support of real time applications
* Acceptance testing of application programs,
* Technical support in the customer environment
* Specific support of OS 1100/TIP/CMS

In addition to requiring experience within the areas mentioned above, it is also desirable to have a background in FORTRAN, and/or general UNIVAC 1100 series exposure.

We offer highly competitive starting salary, a comprehensive benefits program and outstanding professional and personal growth opportunities.

FOR IMMEDIATE ATTENTION, PLEASE CALL COLLECT OR DIRECT YOUR RESUME TO:
P.Y. Peterson

SPERRY UNIVAC

Univac Park
P.O. Box 3525, M.S. U1F28
St. Paul, Minnesota 55165
(612) 456-2309

An Equal Opportunity Employer M/F

position announcements | position announcements | position announcements | position announcements | position announcements

FIELD SERVICE

SYSTEMS	370/360, H-200, XDS, Univac, CDC All Large & Medium CPU's
MINI's	PDP, NOVA, G.A., HP, etc. All Mini Systems
I/O	STC, TELEX, CDC, ITEL, CALCOMP, etc. All Peripheral Experience

MTTR

(312) 344-6750
MTTR ASSOCIATES
1107 Mannheim Road $12-30K
Westchester, Ill. 60153
Field Service Specialist
Nationwide Placement
Private Employment Agency
No Fees To Applicants

PROGRAMMERS

For the most individualized job search offered in the Data Processing field today, on a local or national level, Send resume to:

SEARCH
E.D.P., INC.
Personnel Consultants
13773 N. Central Expwy.
Suite 1305
Dallas, TX 75243

ALL FEES PAID BY EMPLOYER

SCIENTIFIC PROGRAMMERS

Immediate opportunities for experienced scientific programmers in R/T program design for mini- and microcomputers. Experience with assembly languages, H/W interfaces and R/T on-line testing required. Experience in weapons control, air traffic control and automated test equipment desirable. New Jersey suburban location. Excellent benefit package, including savings and dental plans. In confidence, please send detailed resume and include salary history to our Director of Employment.

CW Box 1553
797 Washington St.
Newton, Ma. 02160

An Equal Opportunity Employer M/F

Information Systems Specialists: Your Polaroid career will get better every year.

At Polaroid, our Information Systems Specialists are always working to upgrade our systems, and we like to do the same for their careers.

We provide outstanding compensation and benefits for every member of our corporation and opportunities for career advancement through continuous training and education, career planning and counselling.

Our job posting system allows our people to bid on new job openings before we consider outside applicants. So you can grow in an EDP career or explore new fields without leaving the company.

Right now we are looking for bright, capable people to support our Distribution, Finance, International, Planning, Camera and Film Manufacturing Applications and our Central Systems Software group.

Information Systems Specialist

You will design information systems and prepare specifications to solve defined problems; perform feasibility studies; recommend cost-effective solutions; participate in Corporate Systems budgeting and planning; and develop new, or modify complex computer programs. Some COBOL programming required. This position requires sound business experience as well as knowledge of large scale IBM hardware and software systems, both batch and on-line.

Systems Programmer

You will support the MVT and SVS operating systems, debug system problems, and maintain the SCP's, packages, utilities, HASP, and IMS/360. We are planning a conversion to MVS and IMS/VS. This position requires experience in IBM software (S/370-VS2 or IMS DB/DC), and background in internal or development support. Data communications experience helpful.

All positions require an appropriate Bachelors degree and several years experience. Salary is commensurate with experience.

These openings are located in the metropolitan Boston area. Relocation assistance will be provided. Local interviews will be arranged if necessary.

Send your resume and salary requirements, in confidence, to Charles C. LaPier, Polaroid Corporation, 1265 Main St.,(W2-2), Waltham, MA 02154.

Polaroid

An equal opportunity employer M/F

EDP SALES EXECUTIVES

GEM Markets Base
Salary To $30,000

SYSTEMS & COMPUTER TECHNOLOGY CORPORATION is the leader in the $100 Million plus industry of Higher Education and Local Government Computing Facilities Management. Expansion and continuing growth create long term opportunities for dynamic sales professionals with proven track records in marketing computing facilities management and/or consulting services to high level management decision makers. We are looking for individuals to take the lead in expanding our regional markets across the U.S. A solid EDP sales background, DP management consulting and/or data center management is a must. Our complete training program will offer you a substantial knowledge base in our special segment of the GEM Market.

These high visibility, high growth positions are available now at our Corporate Headquarters. We offer a dynamic environment that provides immediate recognition and financial rewards for results. Stock participation and a comprehensive benefits program are available. For immediate consideration, please send your resume, in complete confidence, or . . .

CALL COLLECT
Mr. William Dransfield
(215) 692-7990
Monday Through Thursday, 10 AM to 7 PM (EST)

SYSTEMS & COMPUTER TECHNOLOGY CORPORATION

Seven North Five Points Road
West Chester, Pa. 19380
Equal Opportunity Employer M/F

The EDP Specialist
TRIMBEC INC.
(Agency)

Specializing in career placement of EDP personnel of all disciplines. Our nationwide clients offer opportunities spanning the full spectrum of the Data Processing Field. Send resume, salary history and geographic preference to the attention of Adele Durham, Data Processing Division. All inquiries will receive immediate response.

7143 Henry Clay Blvd.
Liverpool, N.Y. 13088
(315) 451-4220
WE KNOW THE PEOPLE YOU NEED TO KNOW

Instructor E.D.P.

Private, four year, liberal arts college in southwestern New Hampshire will have a full time faculty position available on September 1, 1978. Must be familiar with both COBOL and BASIC languages and possess 2 or 3 years industrial or teaching experience. Advanced degree preferred. Submit resume by May 15, 1978 to:

Mr. James Scotland, Chairman
EDP Search Committee
Franklin Pierce College
Rindge, N.H. 03461

Equal Opportunity Employer M/F

PROJECT MGRS
IMS-DATA BASE
TO $30,000-MIDWEST

Fortune 500 firm due to growth and expansion currently has openings for several D.B./D.C. proj mgrs. Pref college degree and min 2 yrs IMS/VS applications or software exp. Full career benefits + top oppor. All fees paid. For details contact J.K. Schwab at (704) 375-0600 or send resume including salary in confidence to:

FOX-MORRIS
PERSONNEL CONSULTANTS
1742 Southern National Center
Charlotte, NC 28202
EDP SPECIALISTS

BANKING SYSTEMS

Programmer Analyst
Financial Control System ANalyst
EDP Sales

Florida Openings with Major Bank Group

Enjoy a solid, challenging career with a DP Center serving more than 50 bank offices, in a growth situation, with the stability of an organization that now has over $1.6-billion in assets. Enjoy, too, the advantages of Florida living in an area offering metropolitan resources.

PROGRAMMER ANALYSTS

Requires 2 to 3 years experience in COBOL utilizing IBM 370/145 DOS/VS Systems in a banking environment. Previous assembler language experience preferred. Good working knowledge of DDA savings, installment loans, commercial loans & general ledger applications.

FINANCIAL CONTROL SYSTEM ANALYSTS

This opportunity will provide technical support for the holding company, bank groups, customer services and operations. Will prepare & maintain user manuals for continuing operations. Additional responsibilities for data analysis & system modifications to file layouts, reports, input forms programs and system flows. A basic accounting knowledge is helpful.

EDP SALES

Qualified individual will possess a thorough background in banking and data processing. Responsible for planning, organizing overall activities of EDP Sales to all banking institutions within the Tampa Bay or Miami area. 2 to 3 years' experience in COBOL utilizing IBM370/145 DOS/VS systems in a banking environment.

These positions provide for advancement within a highly progressive environment.

Please send resumes immediately for early interview appointment.

813-224-2262
James B. Madden, Personnel Officer

FLAGSHIP SERVICES CORPORATION
Data Processing Division of
FLAGSHIP BANKS, INC.
4720 Cypress St., Tampa, FL 33601
An equal opportunity employer, m/f

position announcements | position announcements | position announcements | position announcements | position announcements

JOIN THE 32-BIT SUPER MINI LEADER!

SYSTEMS ENGINEERING LABORATORIES IN FLORIDA

SYSTEMS, a strongly established leader in the real-time computer field, has several immediate openings at its headquarters in a highly desirable suburb of Ft. Lauderdale, Florida. We invite you to be a part of a dynamic growth company that offers excellent starting salaries and a full range benefits program, including dental insurance.

LOGIC DESIGNERS

Positions involve custom systems design work. Some microprogramming experience desirable, along with capability to direct activities of junior engineers.

DIAGNOSTICS PROGRAMMERS

Experienced in discovering and isolating hardware faults.

MICROPROGRAMMERS

Experienced in firmware design with a desire to grow within a dyanmic department.

PROGRAMMERS/ ASSEMBLY LANGUAGE

Opportunity to join small group and work on real-time systems development. Should have experience in developing programs in both ASSEMBLY and FORTRAN languages, and have or seek overall systems understanding in a state-of-the-art computer manufacturer environment.

DIGITAL COMPUTER TECHNICIANS

Minimum of 1 year experience working on state-of-the-art computer hardware. You'll work closely with design engineers on advanced hardware computer design.

FOR IMMEDIATE AND CONFIDENTIAL CONSIDERATION, please send your resume or letter of information with current salary to Mr. Frederick J. Brillante.

SYSTEMS
ENGINEERING LABORATORIES

6901 W. Sunrise Blvd., Ft. Lauderdale, FL 33313

We Are An Equal Opportunity Employer M/F

DATA PROCESSING

OCCIDENTAL LIFE OFFERS A SOUTHERN CALIFORNIA LIFESTYLE

LA location is freeway close to beaches, mountains, lakes and streams. Weather provides months and months of tennis, sailing and other recreational activities. Occidental's summer program of early closing Fridays will give you a head start on weekends.

We now have immediate openings for the following EDP Professionals:

PROGRAMMERS/ PROGRAMMER ANALYSTS

Positions require a minimum of 2 years IBM experience. COBOL and OS required.

SYSTEMS ANALYSTS

Positions require a minimum of 4 years DP experience. Experience with insurance, pensions or financial applications will be helpful.

SENIOR DATA BASE ANALYST

Person needed to support systems, programs and data base design for CICS-DL/1 systems. Will also aid in implementation of Data Dictionary and development of standards and procedures for DB administration. Requires 5 years programming/systems analysis experience with 1 year of IMS systems design. Data Dictionary experience is desirable.

We are a large 370 installation utilizing TSO, CICS and IMS.

For an opportunity to discuss your future, we invite you to send your resume complete with salary history to:

Ms. N.K. Yonesato

Occidental Life
A Transamerica Company

1150 South Olive Street, Los Angeles, California 90015

Equal Opportunity Employer M/F

PROGRAMMERS

Dynamic, expanding midwest based multi-billion dollar corporation offers ground floor opportunity for career in development and implementation of new and advanced existing systems. SYSTEMS: Bits & Bites person, proficient in COBOL . . . to $20,000. ANALYST: BAL, CICS, COBOL helpful . . . to $18,500. For Confidential consideration, forward resume, or call

Vicki Anderson
EDP Specialist
Snelling & Snelling
1415 Directors Row
Suite 12A
Ft. Wayne, IN 46808
(219) 482-1511
A licensed employment agency

Systems/ Applications Programmer

Small university requires an individual to assist in the provision of computing services to the academic community. Duties will include: maintenance of RSTS/E operating system on a PDP 11/70; maintenance of statistical and modeling software; development and maintenance of user procedure bulletins; supervision of student operators, programmers and consultants; and instruction of students, faculty and staff members in use of specific systems.

Applicants should possess a minimum of a bachelors degree or equivalent experience in a relevant discipline. Experience in FORTRAN IV and BASIC or COBOL is desired, plus familiarity with time-sharing hardware and software. Expertise in statistics and experience in a college or university environment is highly desirable.

Please submit your resume with references to:

Alan E. Larson
Director, Computer Center
Clark University
Worcester, MA 01610
Clark University is an AA/EOE

CUTLER-WILLIAMS INC.

If you are career-oriented in Data Processing, and desire to expand your horizons with the #1 consulting and programming firm in the country, explore the professional/personal growth opportunities with Cutler-Williams, Incorporated. As a people-oriented company, we offer the challenging ability to diversify your background and experience through varied on-site project assignments in most major industries. We offer long or short term projects on a regional basis or for the adventurous, national travel.

If you have experience in one of the following areas and the desire to be #1 with us, call now.

CICS/ALC/COBOL	PL1/IMS/DB-DC
COBOL/TSO/OIL & GAS APPLICATIONS	FORTRAN
PDP-11/IAS/MACRO-11/ ASSEMBLY	N/C APT III NUMERIC CONTROL SYSTEMS
U1600 UYK 15 or 20	HP 3000, HP COBOL
PL1/MARK IV	COBOL/MARK IV
PL1/TSO	COBOL/IMS/DB-DC

We offer company paid benefits including group hosptilization and major medical plan for you and your family, coverage under our group life insurance program, long-term disability coverage to age 65, and a dental plan.

contact: **Barbara Reed,**

CUTLER-WILLIAMS INC.
2655 Villa Creek #195
Dallas, TX 75234

1(800)527-4907
inside Texas, call collect,
(214)243-7151
or call Pat Blake
(404)321-1743

PRIDE IN PERFORMANCE

an equal opportunity employer M/F

Software Specialists

SPERRY UNIVAC

Technical Services Division

The Technical Services Division of Sperry Univac provides a broad range of software services. We enjoy an enviable record of accomplishment and a reputation for producing high quality software. Our success is due to our highly talented and innovative professional staff. We are seeking top-notch software specialists who feel they can contribute in any of the following areas.

Real Time Tactical Applications

- Shipboard Command and Control
- Weapons Systems Fire Control
- Tactical Data Systems
- ASW Applications
- Intelligence Systems
- Communications

We are seeking experienced Real-Time Assembly language programmers and analysts to participate in several areas of software development. A degree in EE, Computer Science, Math or equivalent experience is required. Experience on Milspec computers, particularly UNIVAC AN/UYK series and 1218, 19, PDP 11 series or ROLM is desired. Opportunities exist in the following locations.

FREDERICKSBURG, VA.

Projects are in support of the Naval Surface Weapons Lab, and involve design, development and integration of advanced real-time software systems. Fredericksburg, a growing community outside Washington, D.C., offers pleasant country living at affordable prices.

LEXINGTON PARK, MD.

We are providing total systems support for Navy Command and Control Systems and Tactical Data Systems, from concept definitions through life cycle maintenance. Lexington Park is located in a relaxed waterfront setting, 60 miles S.E. of D.C.

FOR IMMEDIATE CONSIDERATION
CALL COLLECT: JOHN DePRIMA:
(703) 558-4486
Or Rush Resume To:

SPERRY UNIVAC

Technical Services Division
1901 N. Moore Street
Arlington, Virginia 22209

An Equal Opportunity Employer M/F/H

EDP/Systems Audit Consultants

Opportunity for Total Systems Accountability

The Hartford, a leading property-casualty insurance company, seeks to fill two (2) newly-created positions in its EDP Audit Division.

These consultants will ensure that systems and data processing management is designing and operating DP production systems in accordance with established policies and procedures by:

- **Performing operational audits of new computer applications under Project Life Cycle approach.**
- **Interacting with senior level management in order to provide evaluations of internal and external controls in these applications.**
- **Identifying any deficiences in control and recommending improvements.**

Qualifications include 2-3 years of data processing systems analysis experience coupled with 2 or more years of internal audit or financial controls experience. Working knowledge of a programming language is essential. Bachelor's degree in Accounting, Computer Science, Math, or equivalent.

If you are a highly talented financial systems analyst, this could be your opportunity to break away from typical narrow gauge EDP projects and taken on responsibility for total systems accountability.

To arrange a confidential interview, submit resume including salary history and requirements to:

Christina B. Machnich, Recruiter
Personnel Department
The Hartford Insurance Group
Hartford Plaza
Hartford, Connecticut 06115
An equal opportunity employer/male and female

THE HARTFORD

EG&G, Los Alamos, 7,000 feet high in New Mexico, is currently seeking Scientists.

SCIENTIST

Provide support in collection and analysis of data from laboratory experiments and simulations, writing and running codes, conversion of codes from large computers [CDC 6600] to minicomputers [PDP II/40 &PDP 11/70], assisting in the fielding of prototype systems, theoretical analysis of systems. 2-4 years experience with standard laboratory equipment and practices, familiarity with small computers, programming experience on CDC 6600, CDC 7600, and PDP 11 computer systems. Knowledge of numerical analysis techniques and FORTRAN programming language essential.

Position requires application of scientific knowledge in radiometric data reduction and analysis of photographic data. Incumbent may provide professional technical support for various scientific projects.
Strong background in physics and mathematics. A knowledge of atomic and/or molecular spectroscopy is desirable as is some knowledge of physical chemistry.
FORTRAN programming experience is required.
BS degree or equivalent in Physics is required.

SYSTEMS PROGRAMMER

2-5 years experience in real-time, minicomputer system software and scientific applications software design, documentation and implementation. Familarity with DEC PDP-11 systems, RSX-11 operating system and DECNET.
BS Computer Science, EE or Mathematics or equivalent.

APPLICATIONS PROGRAMMER

2-5 years experience with large scientific codes on CDC 6600 and CDC 7600 or other main frames. Knowledge of numerical analysis techniques. BS Computer Science, EE or Mathematics or equivalent.

Please submit resume with complete salary history to:

EG&G
JUDY D. MCGURN
EG&G, INC.
P.O. BOX 809-A
LOS ALAMOS, NEW MEXICO 87544

U.S. Citizenship required, Equal Opportunity Employer

Stale, Mate?

Think back to the last time you were really challenged. Were you able to use your initiative in meeting that challenge? Or was your creativity stifled by the machinations of a "button-down mind" organization? Here at Doubleday we offer all the challenge and diversification you could want. You will meet it head-on in a professional environment crackling with motivation for personal rewards and satisfaction.

Continued expansion of our activities has created an immediate need for talented individuals at ALL LEVELS to meet this challenge.

APPLICATIONS PROGRAMMERS
SYSTEMS PROGRAMMERS • ANALYSTS

Opportunity to move up to Project Leader within a short time. We are currently operating sophisticated state-of-the-art hardware—twin 370/168's under OS, SVS, MVS.

Doubleday is located in the attractive, desirable suburban environment of Garden City, Long Island, only 45 minutes from New York City.

IT'S YOUR MOVE!

N.Y.C. INTERVIEWS
If You Are Planning To Attend The
COMPUTER CARAVAN EXPO '78
May 9-10-11 At The New York Coliseum
call or come in to our N.Y.C. Office (9AM-8PM)
On the above days—ask for Jeff Kunion—and let's talk!
245 Park Ave. (46 St.—38th flr) (212) 953-4686

Or, CALL COLLECT or send your resume including salary history & requirements in confidence to: MR. JEFF KUNION, Dept. CW-2.

DOUBLEDAY
A COMMUNICATIONS CORPORATION
501 Franklin Ave., Garden City, L. I., N. Y. 11530
(516) 294-4723
An Equal Opportunity Employer (M/F)

D.P. PROFESSIONALS

Many career openings offering excellent advancement potential. Varied hardware & software. Needs include Financial, Insurance, and Manufacturing. All fee paid. Please call or submit resume including salary history.

BENROE & ASSOCIATES LTD
Personnel Consultants
P.O. Box 7874
Greensboro, NC 27407
(919) 292-6831

Programmer/Analyst

$17,313

The City of Alexandria is seeking a programmer/analyst to be responsible for the writing, debugging and testing of new computer programs and modifying of existing ones. This position requires two years of programming experience, preferably on Honeywell equipment and programming ability in COBOL. (This is a one year grant-funded position). Send resumes to the City of Alexandria, 125 N. Royal St., Rm. 106, Alexandria, Va., 22313 or call (703) 750-6441 for additional information.

SYSTEMS ANALYST

With BS in Business Administration or Data Processing. Four (4) years or more experience as programmer or analyst in educational environment and knowledge of COBOL required. Permanent position. Salary commensurate with qualifications. Excellent fringe benefits. Apply to Director, Employee Relations, Lake Superior State College, Sault Ste. Marie, MI 49783. An AAP/EEO employer.

SYSTEMS PROFESSIONALS

RM Industrial Products Company is seeking qualified individuals to fill two immediate openings in its newly structured Systems Department located in Charleston, South Carolina.

PROGRAMMER/ANALYST

Position involves systems and program development on a local terminal system linked to dual UNIVAC 1100 series mainframes. Candidates must be self-motivated and have a minimum of 4 years experience in RPG II and COBOL programming. Exposure to manufacturing and financial applications in batch, on-line and RJE environments desirable. College degree preferred.

DATA BASE COORDINTOR

Position involves determination of data base requirements, monitoring and coordination of on-going maintenance with user departments, and scheduling of input and output terminal processing.
Candidates must be aggressive, self-motivated and have the ability to communicate effectively with user management. Three years experience in data base administration or manufacturing, industrial engineering and cost accounting methods desireable. College degree preferred.
If your background matches the requirements for either of these positions and you have the desire to join an aggressive team, send your resume including salary history in confidence to:

Employee Relations Manager
RM Industrial Products Company
P.O. Box 5205, North Charleston, S.C. 29406
An Equal Opportunity Employer

PROGRAMMER/ANALYST POSITIONS

The State University of New York at Buffalo is accepting applications for programmer/analyst positions within its Administrative Computing department to provide support for a university-wide DBMS development. The positions require an undergraduate degree, a minimum of 2 years experience in the computer field, competency in COBOL, and demonstrable oral and written skills. Successful applicants should be familiar with analysis techniques. Data Base experience in a Univac environment will be highly desirable but other candidates will be considered. Two positions will require individuals with experience in DBMS or MIS on small to medium scale computer systems.

The Buffalo area offers numerous cultural services such as Philharmonic Orchestra and Live Theater, plus a wide variety of winter and summer sports including excellent skiing, sailing and professional sports. Successful candidates may expect highly competitive salaries and excellent fringe benefits, as well as, eligibility for future tenure. The University is fully committed to a DBMS approach for its administrative computing development and will provide the successful candidate with superb career development opportunities. Send resumes in confidence by June 1 to the attention of:

John P. Hansgate
Assistant Director - U.C.S.
SUNY/Buffalo
4250 Ridge Lea Road
P.O. Box 46
Amherst, N.Y. 14226
An Equal Opportunity/Affirmative Action Employer

Investigate Research at Digital

Digital, the world's leading producer of interactive computer systems, has openings for outstanding computer science professionals within our Research and Advanced Development Group. These positions offer a large degree of autonomy where qualified individuals can produce to their maximum potential in a relaxed, interactive atmosphere.

We need top caliber people with doctorates or equivalent theoretical background and demonstrated practical achievement in their specialities. Such accomplishments as books published or patents would be helpful.

SOFTWARE ARCHITECTURE RESEARCHER

The challenge is to develop a totally new way for our users to produce software — making use of software modules to replace conventional programming languages. The goal is to provide the user most of the power and flexibility of a general purpose computer wtihin a specific applications area, without user programming. Major problems to be addressed include design of the user interface, internal design of the software modules, and evaluation of the costs and benefits of this approach to software development.

This position requires a solid understanding of the technical aspects of software engineering, and a demonstrable capability for innovation. Since the initial work will concentrate on the laboratory applications area, knowledge of digital signal processing would be a plus.

SECURITY AND PROTECTION RESEARCHER

Your research and consulting in security and protection will concentrate on operating systems. You will develop a security model which can objectively compare different operating systems. The goal is to evaluate the strengths and weaknesses of existing systems, and especially to influence future ones.

HUMAN FACTORS RESEARCHER

You will be responsible for research and consulting, within the corporation, on human factors problems associated with all aspects of computer systems, emphasizing the application of existing human factors knowledge. This key position will be the nucleus for present and future human factors activities in the Digital Research and Advanced Development Group. Leadership experience would be a plus.

DATA COMPRESSION CONSULTANT

Your principal responsibilities will be to apply known techniques for data compression to practical problems, and to introduce this technology to various areas of the company. Working from the R&D Group, you will serve as a consultant, do prototype implementation, and look for opportunities to exploit data compression in both our products and our internal operations. The position requires an in-depth knowledge of both the underlying theory and practical applications of data compression. Experience should include substantial programming and use of computers. You long term potential as a productive member of a research group is also an important factor.

If you are interested in discovering just how advanced your work could be, we would like to hear from you. Please forward your resume, indicating position of interest, to John DiPietro, Digital Equipment Corporation, Dept. B51 3807, 146 Main Street, Maynard, Massachusetts 01754. We are an equal opportunity employer m/f.

digital

Computer Professionals

Northrop's commitment to promoting from within has created growth opportunities for individuals who desire to become key members of a project team with highly diversified areas of responsibility.

PROGRAMMERS

Associate degree, no experience necessary.

PROGRAMMER ANALYSTS

Degree in Computer Science or equivalent; no experience necessary. Will consider experience in lieu of degree.

SYSTEMS ANALYST

Degree in Computer Science or equivalent and minimum of 5 years experience. Will consider additional experience in lieu of degree.

Working in the areas of Manufacturing Systems Development or Financial Planning Systems, qualified candidates will be creative thinkers who thrive professionally in a small innovative department utilizing a 370/138 DOS/VS, power—VS and CICS/VS.

We offer unparalleled opportunities for professional recognition, challenge and achievement in an environment receptive to your ideas, plus a salary/benefits schedule to compliment your experience. Your resume is invited, complete with salary considerations, addressed to:

Personnel Representative
NORTHROP CORPORATION
Defense Systems Division
600 Hicks Road
Rolling Meadows, Illinois 60008

NORTHROP
an equal opportunity employer

Programmer/Analysts

Immediate Openings
at the
University of New Hampshire

Team Leader - Financial Systems (Computer Specialist IV) - Strong technical and leadership qualities will enable this working leader to provide guidance to team members in developing and maintaining the University's financial systems. Minimum qualifications include a Bachelor's degree or equivalent experience plus five years of significan't experience. Salary range: $14,700 to $22,884. Starting salary normally not to exceed $16,500.

Programmer Analyst - Auxiliary Services (Computer Specialist III) - A creative challenge awaits the technically competent. Accept responsibility for full participation on a small team designing and implementing applications in inventory, order entry, purchasing, and cost accounting. These systems are being integrated to a developing MIS. Minimum qualifications include a Bachelor's degree or equivalent experience plus three years of significant experience. Salary range: $12,780 to $19,824. Starting salary normally not to exceed $14,322.

Additional desirable qualifications for each position are knowledge of DECsystem-10, COBOL and familiarity with Data Base concepts and techniques.

Resumes should be submitted no later than May 12, 1978 to:
Mr. Bill Conroy
University of New Hampshire
Computer Services
Richards House
Durham, NH 03824
An Affirmative Action/Equal Opportunity Employer

COMPUTER PROFESSIONALS

ComPros specializes exclusively in the placement of computer professionals on a national scale. With more than 175 affiliate offices in over 130 major U.S. cities we can explore opportunities in whatever geographic area you wish. We currently have urgent needs in the following areas:

APPLICATIONS PROGRAMMING — requires COBOL or PL1 experience on large scale systems using CICS, TOTAL or MIS technology. Applications include manufacturing, marketing, financial, banking and insurance. Salaries to $28,500

MINICOMPUTER PROGRAMMERS/ENGINEERS — requires FORTRAN and/or Assembly level language programming experience. Will perform software and/or applications development on DEC, Data General, Interdata, Honeywell, Hewlett-Packard or other minicomputers. Applications are real-time and include process control (chemical, petroleum, pulp and paper and manufacturing test processes) and message switching (hardware/software and communications). Salaries to $30,000

If you're ready to explore new opportunities, please forward your resume with your current salary and geographic preference in complete confidence to Key McCarthy (agency).

SPECIALISTS IN COMPUTER PERSONNEL PLACEMENT

ComPros
A Division of Waterrings & Agnew, Inc.

425 Midtown Tower, Rochester, N.Y. 14604 • 716-454-4790

SYSTEMS ANALYST 1

The Ohio State University is seeking an individual to maintain and improve major production systems. Responsibilities include analyzing information needs, designing and revising application systems, and maintaining tape inventories, account records, data sets and Time-Sharing Option libraries. This individual will also train, assist and consult with production system users. Candidates must have a baccalaureate, two years programming/systems analysis experience related to business systems programming and knowledge of IBM PL/1 programming language, IBM 370 Job Control language and IBM TSO facilities. Starting salary: $12,000-$14,640. Benefits of employment include paid vacation and holidays, sick leave and paid medical vacation and holidays, sick leave and paid medical and life insurance. Please refer to position no. 108. Resume must be submitted by may 15, 1978. Send to: Ms. Jill Holland, Manager, Personnel Services, National Center for Research in Vocational Education, The Ohio State University, 1960 Kenny Road, Columbus, Ohio 43210

AN EQUAL OPPORTUNITY/ AFFIRMATIVE ACTION EMPLOYER

Systems Programmer

AMCA International is a rapidly growing company with sales approaching $1 Billion. We are a large manufacturing concern with many offices in the U.S. and Canada, using heavy RJE. The opening for systems programmer would require an individual with heavy experience in SVS/MVS. HASP and TSO. Experience with CICS. DL1. TCAM and VTAM is a definite plus. Present equipment includes a 158-3 running SVS. with plans to upgrade to MVS to support a large network of CICS and TSO. Send detailed resume and salary requirements to:

AMCA
Computer Services
AMCA International Corporation

5775 Summer Trees Drive
Memphis, Tennessee 38134

Detach here, moisten and seal envelope securely before mailing.

Fold and insert order form (attached through binding) and remittance here.

USE THE ATTACHED ORDER FORM AND THIS ENVELOPE FOR:

- ☐ *a new subscription*
- ☐ *new address*
- ☐ *new title*
- ☐ *new industry*

Order form is attached through binding. Be sure to include current label or label information when making a change.

first class
permit no 40760
newton ma

BUSINESS REPLY MAIL *no postage stamp necessary if mailed in the United States*

postage will be paid by

COMPUTERWORLD

797 Washington Street
Newton MA 02160

CIRCULATION DEPARTMENT

position announcements | position announcements | position announcements | position announcements | position announcements

MIAMI, FLORIDA SAVINGS & LOAN

NCR EQUIPMENT

2 PROGRAMMER/ ANALYSTS

We are looking for the two most capable programmer/analysts-ideally with savings experience on NCR equipment.

We are a rapidly growing $750 MM S&L with a progressive and involved management team. We are extremely results-oriented — our philosophy is to hire quality rather than quantity. We offer a people-oriented and flexible working environment.

We consider these to be exceptional ground floor opportunities with unlimited advancement potential both within and outside of the EDP department.

We are currently converting from a serviced system to an in-house NCR Criterion system with CLASS software and MTS terminals.

Salary for the senior person will be between $20-$26, for the second person $15-$19.

Write including salary history to: DP MGR., 1790 Biscayne Blvd., Miami, Fla. 33132.

DATA PROCESSING PIKES PEAK AREA

The City of Colorado Springs is accepting resumes for two positions in the Data Processing/Computer Center. Positions require proficiency in COBOL and on Univac 1100 systems. Experience in the development and design and on-line order entry. Capability to design and maintain direct access files including record handling via indexing. Training in systems analysis with special emphasis in project management, user relations and data gathering techniques:

Systems Analyst - ($1419-$1641) - BA degree in computer programming or related field with 5 years experience in above.

Programmer Analyst - $1255-$1454) - BA degree in computer programming or related field with 3 years programming experience and training in systems analysis.

Submit resume by May 12, 1978, to Scott McGill, Director of Data Processing, 217 So. Wahsatch, Colorado Springs, CO 80903.

An Equal Opportunity Employer

Programmer/Analyst

Data Processing

An immediate opening exists for a Programmer/Analyst in a progressive System/3 - Model 15D installation. Applicant must have a minimum of 2 years RPGII programming experience on the SYS/3. Manufacturing experience is desired. MRP, IPICS experience a plus. Excellent salary and fringe benefits. Send resume in confidence to:

J.R. Jones
Div. Mgr. Employee Relations
Boise Cascade Corp.
P.O. Box 514
Berryville, VA 22611

Equal Opportunity Employer

COMPUTER CUSTOMER ENGINEERS

Unusual opportunity for person with your type experience in computer systems to coordinate maintenance programs - equipment utilization - communication/training in hardware/software - Extensive travel to plants in CA, PA, TN, KS. Relocation Program. Requires innovative person who can accept responsibility. Very good compensation package. Send resume detailing work history and salary requirements to C.W. Meredith.

Josten's American Yearbook Company
5501 Norman Center Drive
Minneapolis, MN 55437
Equal Opportunity Employer M/F

PROGRAMMER/ANALYST

Immediate Central New Jersey State Government positions available. Experience in Honeywell 66/40 systems using Cobol-74 desired.

Analysts preferred experience with large scale on-line business applications.

Salary dependent upon experience. Excellent benefits.

Call collect
(609) 890-9500
Extension 455
Monday thru Friday
8:30 AM to 4:00 PM

Look to tomorrow and find...

WANG LABORATORIES, INC.

WANG LABORATORIES' innovative approach to the word processing and computer industries is making our leadership in the marketplace of tomorrow assured. Our R&D teams create state-of-the-art and beyond ... our manufacturing teams put out a well-made product ... our marketing staff keeps our name in the forefront of the industry ... and our support staff keeps our operation running smoothly. It is exciting and satisfying to work at WANG Laboratories. If you are good at what you do, why not investigate joining us?

Senior Customer Training Specialist - Computer Systems

A career opportunity exists for a person who enjoys the challenge of educating customers and internal marketing people on the utilization of computer hardware and operating system features. You will have the opportunity to be creative and apply your knowledge in the development of new courses as well as modification of existing programs. This position requires a person:

- Who is creative and self-starting.
- Who has at least 3 years experience in the following areas:
  - — Instructional experience in hardware and/or Operating Systems to Customers. Prefer Virtual Storage Systems.
  - — Knowledge of interactive and time sharing systems
  - — Field Experience as a Systems Analyst/Programmer with applications knowledge
  - — Excellent programming experience in RPG II and COBOL.
- Who has excellent communications skills.

If you have the experience and are interested in this growth position, we want to speak with you.

Sales Training Specialist - Computer Systems

The Education Center has a rewarding and challenging opportunity for a person who has been successful in sales and has the ability to train salespeople in product and skills. This is a highly visible position which requires a person to have:

- A minimum of 3 years of computer sales experience, preferably with knowledge of transaction and interactive computer systems
- The knowledge and ability to relate hardware and operating system features to the sales force
- Successful sales skills knowledge
- The ability to communicate well with all levels of management
- Excellent writing skills.

Additional requirements: College degree and training experience preferred.

Software Technical Writers

WANG is looking for software technical writers to document our new state-of-the-art 2200VS computer system. We need people with the technical ability to understand the various facets of a modern computer system and the writing ability to explain them clearly and coherently to others. We offer plenty of growth potential and the opportunity to work in a creative, challenging environment where individual achievement is recognized and rewarded. Our requirements are:

- Knowledge of at least one high level language, preferably COBOL, BASIC, or RPG II. (Knowledge of an Assembler language would be a plus.)
- Familiarity with a major computer operating system
- 1-3 years experience documenting or working with system software (programmers with a flair for writing are invited to apply).
- The initiative and creativity to follow a project through from initial research to final copy.

If you meet these requirements, we'd like to talk with you.

Field Service Instructors

Qualifications:

- 2 years experience as Technical Instructor
- 2 years field service experience in support of minicomputer systems

Responsibilities:

- Curriculum development
- Structure and conduct field service training classes in support of microprocessor controlled, disk-based systems.

Excellent salaries and earning potential plus superior company benefits. Please send resume including academic background and salary history and requirements to:

Linda G. O'Connor
Career Opportunities
(617) 851-4111

WANG LABORATORIES, INC.

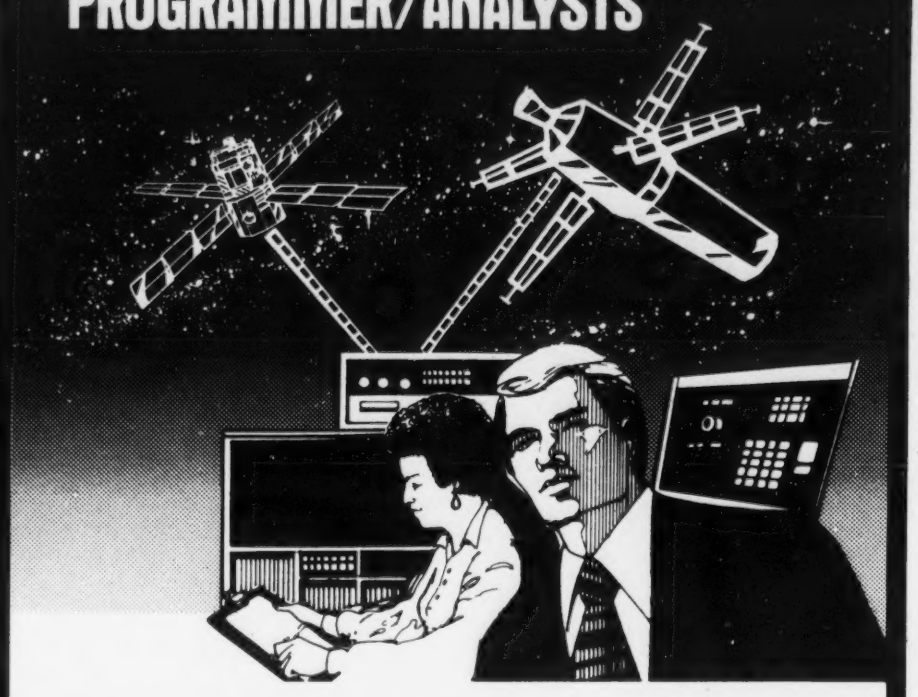
One Industrial Avenue
Lowell, Massachusetts 01851

We are an equal opportunity/affirmative action employer.

position announcements | position announcements | position announcements | position announcements | position announcements

CSC

PROGRAMMER/ANALYSTS



There's One Company That Has Growth, Challenge and Stability!

CSC can offer you all those and more. We are the leader in the information sciences industry with over 8,500 computer professionals and we're continuously expanding into areas allowing professional stimulation and growth.

CSC's System Sciences Division deals with the space sciences in a unique way, calling for a degree in Computer Science, Math, Physics, Astronomy or Engineering. Fortran and/or Assembly Language background required. You will work on highly complex projects requiring programming and analysis of major systems . . .

Opportunities include distributive network systems, data base mangement, real-time satellite command/communications systems, real-time operating systems, 360 OS Fortran programming AND microprocessor and minicomputer software design and development.

You will be supporting our Mission Support, Scientific and Applications, and Space Tracking Data Network Projects with the NASA Goddard Space Flight Center, located in the Maryland Suburbs near Washington, D.C.

We offer competitive salaries and a complete benefits package including liberal relocation. For further information, please send resume or call:

Staffing Department
Toll Free: 800--638-0842 OR Call Collect: (301) 589-1545

COMPUTER SCIENCES CORPORATION
System Sciences Division
8728 Colesville Road, Silver Spring, Md. 20910
Major Offices And Facilities Throughout The World
An Equal Opportunity Employer

Business Systems Programming
SECTION SUPERVISOR

If you are seeking a growth position with a well-managed, well-recognized pioneer in electronic technology, here's a golden opportunity.

We are presently accepting resumes to fill an opening at our Orange County facility. Selected candidate will supervise systems analysis and programming for applications related to Manufacturing, Material, Engineering, Product Assurance and Logistics.

Other responsibilities will include: planning, designing, implementing and maintaining all business computer systems for these functional areas. Supervisory experience, degree in Business Administration or equivalent and extensive knowledge in related functional areas are highly desirable.

We provide excellent salary and a complete benefits program. For immediate interview, send resume with salary history to:

CW Box 1559
797 Washington St.
Newton, MA 02160
Equal Opportunity Employer M/F/H

Search Extended for Manager of Data Processing and Operations

Center for Faculty Evaluation and Development in Higher Education Kansas City University, Manhattan, Kansas.

This person will be responsible for computer operations, including production of reports available from the Center, explaining the technical aspects of these systems to institutions which use them, and the development or adaptation of computer programs.

Minimum qualifications: Masters degree in related field; programming experience in PL/1; knowledge of basic statistics; experience in using computer-based statistical packages; administrative skills including planning, organization, and coordination skills.

Starting salary range: $15,000-18,000 based upon preparation and experience. Date of appointment: No later than 1 July 1978. Date of application: No later than 19 May 1978. Rank: Assistant Professor.

For a detailed description call 800-255-2757 or 913-532-5970.

Submit application materials to: J. Lance Kramer, Associate Director, Division of Continuing Education, 301 Umberger Hall, Kansas State University, Manhattan, KS 66506.

Kansas State University is an equal opportunity, affirmative action employer.

PURDUE UNIVERSITY COMPUTING CENTER

Has openings for applications programmers with at least one year of relevant experience on a large CDC System, and a B.S. or M.S. in computer science or engineering or in a related academic area. We seek highly motivated individuals who can take full responsibility of all aspects of a programming project and can carry it to completion.

Slected individuals will be responsible for development, documentation and maintenance of applications programs and subprograms. At least one year of Fortran programming experience required. Experience with other scientific programming languages helpful.

Salary: $12,000 to $20,000 depending on qualification. Excellent benefits in addition to salary. Excellent opportunities for personal and professional advancement.

Write: Mr. Tom Hayworth, Administrative/Professional Employment, Personnel Services, Adms. Building, Purdue University, West Lafayette, In 47907

Purdue University is an Equal Opportunity/Affirmative Action Employer

Our computers help make the perfect fit

JOB SEEKERS

JOB OPENINGS

CYBERSEARCH® is the **computerized** technical/professional employment service for recruiters and job seekers. Here's why it works much better than conventional matching of jobs with applicants.

Faster. Our computers can make a local or nationwide search for applicants in minutes.

More accurate. Better matching eliminates wasted interviews.

More complete. Information readily available from the data bank. Can't be misfiled or out-of-files.

Confidential. Individual and company names are coded.

EMPLOYERS, call nearest Cybersearch office for immediate service.

Ask for the Data Processing Department.

JOB SEEKERS, please send resumes.

CYBERSEARCH
The *COMPUTERIZED* Employment Service

CHICAGO, IL
214 North Michigan
60601
312-454-9490

IRVINE, CA
17744 Sky Park Boulevard
92714
714-754-7701

PHILADELPHIA, PA
Two Bala-cynwyd Plaza
19004
215-667-2400

DALLAS, TX
8585 Stemmons Freeway
75247
214-688-5810

LOS ANGELES, CA
6616 La Tijera Boulevard
90045
213-642-2482

SAN JOSE, CA
2025 Gateway Place
95110
408-998-3186

HOUSTON, TX
2000 West Loop South
77027
713-965-5686

MINNEAPOLIS, MN
6800 France Ave. South
55435
612-830-0850

CONTROL DATA CYBERSEARCH INC

OVERSEAS OPPORTUNITY

LEAD SYSTEMS PROGRAMMER

We are a worldwide leader in the marine engineering and construction industry offering a challenging data processing position in our Dubai, U.A.E. operations.

The applicant must possess B.A. in Math or Computer Science and 6 years in data processing, 3 years of which are in systems programming. The applicant should be familiar with 370/135 migrating 2A one megabyte 138. Must have experience with DOS/VS operating systems with power, CICS on-line systems, assembly language coding. It would be a plus to be familiar with Panvalet and PL/1. Applicant should also be able to support a system with minimum vendor support.

This challenging growth position offers excellent salary, family status, overseas premium and fringe benefits package. Please submit resume, including salary history in complete confidence to:

W.J. Buckley

Oceanic Contractors, Inc.
A Wholly-owned subsidiary of
J. Ray McDermott & Co., Inc.
P.O. Box 61961
New Orleans, LA 70161
We are an equal opportunity employer M/F

AUSTRALIA

DB/DC SUPPORT STAFF

Up to $A17,750 p.a. plus Benefits

The Bank of New South Wales, Australia's largest commercial bank, and one of the largest I.B.M. users in Australia, is seeking experienced DB/DC Support Staff for its software group located in Sydney. The bank is currently committed to IMS based data base and data communications development on a large scale.

DUTIES
Participate as a member of the DB/DC Group in supporting the development, maintenance and operation of new and existing systems using IMS/VS Data Base and Data Communications, and the LEXICON Data Dictionary. Responsibilities include data base design, IMS/DC tuning and performance, data base recovery design and general problem solving.

EXPERIENCE
1-2 years experience in IMS/VS DB or DC. Training could be provided for a person with experience in:-
- IBM equipment with OS/VS;
- other DBMS;
- application development technical control;
- systems programming.

HARDWARE
Three 370/158's in Sydney and six 370/145's in other States using 3705 communication controllers and other peripheral equipment supporting a network of 3600 finance terminals in its first stages of implementation, as well as an extensive range of batch and on-line systems.

SOFTWARE
The bank has installed MVS,VS1, TSO, VTAM/NCP, IMS/DB/DC and expects to remain in the forefront of SNA development in Australia.

CONDITIONS
Air fares and relocation expenses for your family (USA—Australia) will be met by the bank and up to three months' subsidised transit housing can be available. These are long term career positions.

THE JOBS
A range of positions is available requiring different levels and types of expertise. While extensive training opportunities are available, some degree of expertise in any of the above software fields is essential.

BENEFITS
Four weeks' annual leave with pay loading.
Superannuation.
Housing finance available in line with bank's current lending policy applying to specialist staff.

APPLICATIONS
Please apply in writing to:
Brian Bussell
Bank of New South Wales
New York Agency
Suite 2412, 24th floor
200 Park Avenue
New York, N.Y. 10017
Arrangements will be made to interview selected applicants in late May.

Bank of New South Wales

Mini Computer Programmers.

all levels

We are looking for individuals who can aggressively pursue **System Software Projects** from design through implementation. The right candidates will be self-motivated, capable of scheduling their time, know machine language programming and are willing to commit to getting the job done. **Openings are available in the following areas:**

Communications software group:

Familiar with communications programming under real time executives and operating systems. Two to five years machine language programming experience and two to three years in communications applications.

Languages and operating system utilities group:

Should have solid experience with high level language Compilers and Interpreters, and / or system utilities such as assemblers, editors, loaders and debugging tools. Two to five years machine language programming experience in related areas.

Operating systems group:

Opportunities for experienced Programmers to enter ground floor development of new and progressive operating systems. Also design and implement enhancements to a variety fo operating systems and real time executives. Three to five years real time programming and assembly language experience preferred.

EXPLORE THESE EXCITING OPPORTUNITIES!

Call Tom Soderquist COLLECT at: (714) 833-8830, Ext. 349 for immediate appointment (after hours or week-end appointments arranged) or send your resume to:

Tom Soderquist
ComputerAutomation
18651 Von Karman — Irvine, California 92713
Equal Opportunity Employer M/F

SYSTEMS PROGRAMMER

Immediate opening for experienced DOS-CICS systems programmer. Responsibilities include implementation and network management of a leading edge, on-line teleprocessing system for a progressive trucking company headquartered in Southwestern Ohio. Excellent career opportunity for capable, personable individual. Attractive starting salary and benefit program. Forward resume and salary history for consideration. **Reply to: CW Box 1547, 797 Washington St., Newton, Ma. 02160**
An Equal Opportunity Employer

PROGRAMMER/ANALYST

The State University of New York at Binghamton is seeking a programmer/analyst for the support of academic research and instruction. This position offers potential to work with academic disciplines as diverse as chemistry and music. An opportunity exists to develop essential academic computer resources and to gain increasingly important management and communication skills. The Computer Center provides excellent interactive and batch resources.

This position requires at least a bachelor's degree, and three years applicable experience. Relevant experience can include computer-related work performed as a student or researcher. Expertise in statistical data processing and/or mini-computer systems is desirable.

SUNY-Binghamton is one of four university campuses in the State University of New York System. The campus of 9,500 students is located near a variety of cultural and recreational resources. The salary for the position is competitive, with an outstanding benefits package.

SUNY-Binghamton is an equal opportunity employer. Please send your resume by May 15, 1978 to:

Dr. Russell S. Vaught
Associate Director,
Computer Center
SUNY-Binghamton
Binghamton, NY 13901

PRODUCT MARKETING SPECIALIST

with Data Processing/Computer Industry experience

Make Your Future with the Leader

Datapoint Corporation, the leader in dispersed data processing, has grown over the last five years at an average rate of 45% annually. To help continue this growth, an immediate need exists at our headquarters in San Antonio, Texas for a strong, capable individual with an MBA and preferably one to two years experience in marketing. It is absolutely essential that applicants possess a strong working knowledge of data processing and/or the computer industry. A technical under-graduate degree is desirable.

The successful applicant will be assigned marketing responsibility for a product or group of products, and will be called upon to plan strategies, prepare competitive analyses, develop product configurations, prepare price lists, coordinate pre-release activity and execute product introductions. Attendance at trade shows, customer presentations, market research, field sales training, demonstration of products and coordination of merchandising support will be among your activities.

This position offers an excellent starting salary, commensurate with your background and experience, plus a comprehensive benefits package. Qualified applicants are urged to forward resume in confidence to **John Ross, Mail Station M-84, Datapoint Corporation, 9725 Datapoint Drive, San Antonio, Texas 78284.**

An Affirmative Action Employer Committed to Equal Opportunity

DATAPOINT CORPORATION

The leader in dispersed data processing™

AUSTRALIA

Senior Systems Programmer/ Systems Programmers

Up to $A17,750 p.a. plus Benefits

The Bank of New South Wales, Australia's largest commercial bank, and one of the largest I.B.M. users in Australia, is seeking experienced systems programmers for its software group located in Sydney. The bank is currently committed to IMS based data base and data communications development on a large scale.

EXPERIENCE
At least two years' experience in an IBM OS software environment.

HARDWARE
Three 370/158's in Sydney and six 370/145's in other States using 3705 communication controllers and other peripheral equipment supporting a network of 3600 finance terminals in its first stages of implementation, as well as an extensive range of batch and on-line systems.

SOFTWARE
The bank has installed MVS,VS1, TSO, VTAM/NCP, IMS/DB/DC and expects to remain in the forefront of SNA development in Australia.

CONDITIONS
Air fares and relocation expenses for your family (USA—Australia) will be met by the bank and up to three months' subsidised transit housing can be available. These are long term career positions.

THE JOBS
A range of positions is available requiring different levels and types of expertise. While extensive training opportunities are available, some degree of expertise in any of the above software fields is essential.

BENEFITS
Four weeks' annual leave with pay loading.
Superannuation.
Housing finance available in line with bank's current lending policy applying to specialist staff.

APPLICATIONS
Please apply in writing to:
Brian Bussell
Bank of New South Wales
New York Agency
Suite 2412, 24th floor
200 Park Avenue
New York, N.Y. 10017
Arrangements will be made to interview selected applicants in late May.

Bank of New South Wales

When Computer Professionals in Atlanta Interview with Advanced Software Technology Managers from Texas Instruments, this Could Be The Start of Something Big.

At Texas Instruments, you can get ahead faster than with anybody else. Here's why:

1. You are needed right now. Our project teams are crying for good professionals who can grab hold fast.

2. You'll have state-of-the-art challenges of all kinds. TI is the technological leader in literally scores of product fields. This leadership has produced more than 7,000 patents.

3. You'll have a chance to prove how good you are. Everybody is evaluated regularly; there are no missing persons at TI. If you're good, you move up fast. No matter how long the people above you have been there.

4. You'll work on a complete system. No threat of getting locked into a repetitious specialty. You'll work on a small project team. You'll interface daily with other disciplines and other phases of your overall program.

5. You'll be in a job-stable, multi-market position. We have a variety of products and markets. We're not heavily dependent on any one of them—and neither is your job.

6. You have lots of jobs to choose from:
Systems Engineering
Systems Analyses
Systems Design
Engineering Applications
Distributed Computer Design
Airborne Computer Design
Minicomputer Operating Systems
Compiler Design
Artificial Intelligence
Computer Aided Design
Microprocessor Applications
Scientific Applications
Business Applications
Numerical Analyses
Quality Assurance
Software Management
Image Processing
Software Engineering
Software Validation and Verification

Openings in Dallas, Austin, Lubbock and Sherman, Texas. A choice of super Sun Belt cities. Where there's no state income tax. No city income tax. Low cost of living and lots of pro sports and good life to enjoy. Or talk to us about Ridgecrest, California.

U.S. Citizenship or permanent residency required.

Atlanta Interviews
Wed., Thurs. & Fri., May 10, 11 & 12.
Call Beth Moody at (404) 577-1234
from 9AM-8PM Wed. or Thurs.,
or from 9AM-3PM Fri.

To arrange an interview in advance, call Beth Moody at (214) 238-5311.

If unable to arrange an interview on these dates, send your resume in confidence to: Ed Haynes/P.O. Box 6015, M.S. 222, Dept. 7939/Dallas, TX 75222.

TEXAS INSTRUMENTS
INCORPORATED

An equal opportunity employer M/F

MANUFACTURING APPLICATIONS DEVELOPMENT

We're looking for manufacturing application specialists with all levels of knowledge and experience who are interested in joining a progressive, dynamic organization developing business systems for sale to our customers and use in our plants. The system is a complete business system for the discrete manufacturing firm and includes such subsystem areas as Bill of Material, Inventory Control, Material Requirements Planning, Work-in-Process, Purchasing, Master Scheduling, Capacity Planning, and Order Entry.

The system is being implemented for use on NCR's latest generation of large mainframe processors, the Criterion. The system also utilizes transaction processing software to facilitate on-line interactive communication to terminals. NCR-TOTAL is the data base management system. All programs are written in COBOL.

If this sounds like something you would like to be involved with, and you have at least a bachelor's degree, 2 or more years of comparable experience, know and have used COBOL, and have experience with large systems, we would like to invite you to come to Dayton for a personal interview.

For immediate consideration, please send your resume including salary history to:

Department VM
Corporate Executive &
Professional Recruitment
NCR Corporation
Dayton, Ohio 45479

NCR Complete Computer Systems

An Equal Opportunity Employer

PROJECT LEADER
CREDIT CARD SYSTEM

Join a professional data processing organization with challenging growth opportunities for career oriented individuals. We are seeking professionals that are interested in a OS/VS state-of-the-art environment and who possess the following skills: Three or more years having COBOL OS JCL knowledge. System Analyst, coding, debugging, and implementation. Experience with FDR credit card system is desirable but not required. We are conveniently located in down town Cincinnati, Ohio and we offer an excellent salary and benefit program.

For those interested candidates, please forward a copy of your resume and salary history to: M.L. Bush, The Fifth Third Bank Personnel Department, 38 Fountain Square Plaza, Cincinnati, Ohio 45202. An Equal Opportunity Employer.

UPCOMING REQUIREMENTS
for
SERVICE BUREAU PERSONNEL
in
SAUDI ARABIA

PROGRAMMER/ANALYSTS - Systems and Applications Programmers and Analysts for commercial and scientific applications. FORTRAN and COBOL are used for applications. Familiarity with the IBM 1130 and DNA Systems TSO/CYTOS preferred. **Excellent compensation package including salary, incentive, and bonus plans, including expatriot premium. A one year contract with completion bonus is included.**

Ground floor opportunity for qualified individuals. Overseas experience preferred.

Reply in confidence to CW Box 1558, 797 Washington St., Newton, MA 02160.

PRODUCT MANAGERS

Are you an aggressive, take-charge, organized individual who is willing to travel and accept the challenge of total responsibility for a successful product line?

We're offering a rewarding, high-visibility position to the individual who is experienced with IBM operating systems (OS thru MVS) and has excellent oral and written communications skills. A degree in marketing, business or computer sciences is highly desirable as well as experience in performance evaluation, system monitors and telecommunications, systems programming, systems engineering or software product development.

You will interface with top management and will be responsible for all of the functions associated with guiding, directing, and coordinating a leading software or hardware product line in the international market.

If you qualify, please call today toll-free (outside California) 800/538-1872. Or send your resume and salary requirements to:

Peter A. Bornstein
Director of Product Management
Boole & Babbage, Inc.
510 Oakmead Parkway
Sunnyvale, CA 94086
(408) 735-9550

Boole & Babbage

Boole & Babbage, the leader in computer perforamnce, accounting and operations software products, is an Equal Opportunity Employer.

MINICOMPUTER CUSTOMER ENGINEERS – WE OFFER YOU THE OPPORTUNITY TO EXCEL

The University of California's Los Alamos Scientific Laboratory needs outstanding applicants to support our expanding, multi-faceted R&D efforts. If you desire challenge, responsibility, and the chance to excel, we invite you to apply for a career with us.

As a member of our in-house minicomputer maintenance team, you will work independently, diagnosing and repairing mainframes, memory, peripherals, and disk storage systems on a wide variety of computer systems based around the DEC PDP-11 family of minicomputers.

The successful candidates must be technical school graduates (or equivalent) with significant manufacturer's training. In addition, several years' experience maintaining the PDP-11 family of computer systems, as well as an excellent working knowledge of trouble-shooting techniques, central processors, mass storage devices and other computer equipment, is required.

We provide excellent compensation, working conditions, and benefits (how does 24 days' annual vacation sound?). Our location in the mountains of northern New Mexico offers a pleasing lifestyle in a setting of great natural beauty: abundant recreational opportunities; a pollution-free environment; and casual, uncrowded living.

Please send complete resume and salary history, in confidence, to, or request application from:

James Trout
Division 78-KK
Los Alamos
Scientific Laboratory
P.O. Box 1663
Los Alamos, New Mexico 87545

An Affirmative Action/Equal Opportunity Employer
Women, Minorities, Veterans, Handicapped, Urged to Apply
U.S. Citizenship Required

Programmers

Senior Systems Programmers

The successful candidates will participate in the design and implementation of software to support a nationwide research library network. Implementation experience in one of the following specialty areas is mandatory: generalized on-line database/information retrieval systems, library automation systems, disk access methods, or on-line applications programming. In addition, close familiarity with 360/370 assembler language is desired.

Communications Support Personnel

Candidates will possess a high school diploma and 2 years experience in data communications. Desired experience includes data transmission over TELCO circuits; diagnosis and repair of terminals, modems, and other pertinent equipment. Knowledge of TELCO and EIA interfaces, and a working knowledge of testing devices and methods employed to support long distance communications.

Please send resume and salary history to: P.C. Coulter, Ballots Center, Encina Commons, Room 103, Stanford University, Stanford, CA 94305. An Equal Opportunity Employer Through Affirmative Action.

STANFORD UNIVERSITY

SYSTEMS ANALYSTS (DATA PROCESSING)

We are one of the largest teaching and research medical facilities in the Midwest, currently seeking several Systems Analysts for our Systems and Procedures Department.

To qualify, you should have at least 5 years experience in programming at the Senior Programmer/Analyst or Systems Analyst level, and have a thorough, state-of-the-art knowledge of COBOL (a second language is highly desirable); OS-JCL, Utilities, Operating Systems, Sort-Merge, and CICS. You must have had previous responsibility for at least one major project from inception to completion. Experience in the design, programing, and implementation of on-line systems is helpful but not mandatory. You should be familiar with concepts of packaged software (preferably MSA) and possess good analytical skills and judgment. In all respects, the applicant we seek must be a professional.

If selected, you will be responsible for the installation of packaged financial software, the design, programming, installation and debugging of programs, analyzing program or system problems, investigating software programming aids or tools, and setting up standardized procedures. You will report directly to the Manager of Systems and Procedures and be assignable on a consultant basis to special projects. You must have strong managerial skills, as you will supervise Programmer/Analysts in the programming of large or complex systems.

We offer qualified individuals an excellent salary and comprehensive fringe benefits package that includes paid relocation and tuition reimbursement. For consideration, please send resume, including salary history and requirements to:

David J. Kinsella
Manager, Employment

MICHAEL REESE HOSPITAL & MEDICAL CENTER

29th and Ellis Ave. Chicago, IL 60616
An Equal Opportunity/Affirmative Action Employer M/F

DATA PROCESSING MANAGER

CITRUS COUNTY, FLORIDA

Join a dynamic organization in establishing a County data processing installation.

Excellent opportunity for individual who has already proved himself a capable manager and has been instrumental in establishing one or more installations from their inception. Ability to communicate effectively with all levels of County management is essential.

If you possess such qualifications, why not earn a salary in the twenties and excellent fringe benefits while enjoying America's vacationland year round.

Experienced programmers also needed.

Send resume in confidence to:
Walt Connors, Clerk
Citrus County Courthouse
Inverness, FL 32650

D P PROFESSIONALS

Our client Companies include Consulting Firms, Manufacturers, Banks, Insurance companies, Oil & Gas companies and Software Houses. They offer career advancement opportunities, strong benefit packages, company-paid moving and interview expense and they pay our fee. We have numerous openings in the Southwest for the Professional Programmer/Analyst. Critical needs include TP, Data Base and MINI computer Programmers.

DUNHILL EMPLOYMENT AGENCY OF FT. WORTH, INC.
901 Ridglea Bank Bldg., Ft. Worth, TX 76116
(817) 732-8191

Senior Systems Analysts

Combine your scientific and business know-how in these project leadership roles.

These high visibility positions require in-depth experience and the stature to interact with middle and upper echelon management in effectively developing large bill of materials, financial and documentation control applications.

Ideal candidates will have Bachelor's degree in Computer Science, Accounting, Finance or Business Administration and 6 to 8 years successful experience in the design/implementation of business systems and at least 2 years technical programming. Minimum 4 years relevant systems design experience and proven ability to present ideas also necessary. Experience with IBM 370, TOTAL and TSO helpful.

Babcock & Wilcox is a growing high technology energy company and offers excellent salary, full benefits and a comfortable lifestyle in a favored Blue Ridge Mountains area. Write in confidence, detailing experience and salary history, to Mr. G.W. Bunch, Ref. 317,

Babcock & Wilcox
Power Generation Group

P.O. Box 1260, Lynchburg, Va. 24505
An Equal Opportunity Employer M/F

H 600 OPERATORS

Prominent PHILA svc co has asked to recruit for multiple openings. LGE SHOP H 6000 Exp ESSENTIAL. Any GECOS a +. Depending upon exp, salary $9,000-$12,000. Planned career path.

For confidential attention, call or send resume to:

ROBERT HALF
PERSONNEL AGENCIES
2 Penn Center Plaza
Suite 706
Philadelphia, PA 19102
(215) 568-4580

PROGRAMMERS

We respect YOU and YOUR time!
We will serve you initial interviews.
We will not "shop" your resume.
We will NOT put you on a "general" mailing list.
Simply mail your resume to us; Fees Paid.

ELECTRONIC DATA PERSONNEL Agency, Inc.
175 One Shell Plaza
Houston, TX 77002
713/225-5259

"Your future is important to us"

MVS PROGRAMMERS SYSTEMS APPLICATIONS NETWORK

If you have recent experience or are now working with OS/MVS in applications, systems or network programming we have career positions you might be interested in. Excellent benefits and working conditions. A proven growth company devoted to technical excellence.

FIND OUT ABOUT IT!

Send resume with salary requirements to

Data Services

700 W. Hamilton Ave. Campbell, CA 95008

Attn: Jeneil Wieman

Control Data Corporation

Equal Opportunity Employer M/F

position announcements | position announcements | position announcements | position announcements | position announcements

Senior Analyst
NCR-CIF-FOCUS

We are a leading W. Va. bank seeking a data processing professional to assume a major role on the systems and programming staff in the expansion of its multi-bank data processing center.

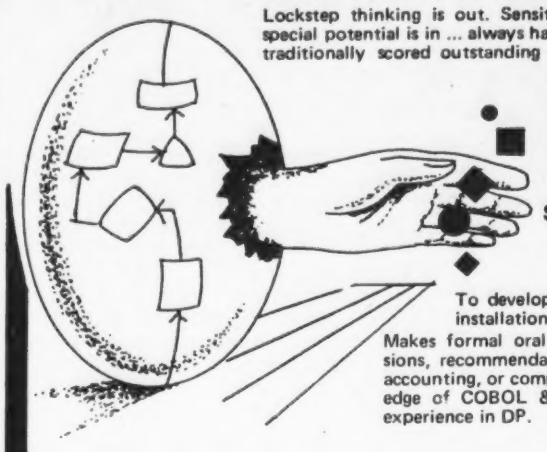
Candidates must have several years of banking experience and in depth knowledge of NCR hardware and banking software. Excellent communications skills and supervisory ability are required.

We offer excellent salary/benefits package and an opportunity to become involved with the latest NCR hardware and software in an on-line environment.

Michael McKinney
Director of Data Processing
The National Bank of Commerce
P.O. Box 633
Charleston, W.VA. 25322
(304) 348-5065

We are an affirmative action employer M/F/H

Take a giant step forward with a company that fosters creative individuality



Lockstep thinking is out. Sensitive management awareness of the individual's special potential is in ... always has been with HAMMERHILL — a company that's traditionally scored outstanding success through new ideas, new efficiencies in nationwide manufacturing and marketing of quality paper products. In the same spirit we're looking to make our great DP systems still greater — an exciting challenge that's created these excellent opportunities in a medium scale system 370 environment.

SYSTEMS ANALYSTS OPPORTUNITIES

LEAD SYSTEMS ANALYSTS

To develop and modify DP systems; define and supervise installation procedures. Evaluate OS and improvements. Makes formal oral and written presentations of findings, conclusions, recommendations. Needs Bachelor's degree (statistics, math, accounting, or computer science major) with MBA desirable. Knowledge of COBOL & CICS. Minimum 6 years experience including experience in DP.

SR. SYSTEMS ANALYST

Responsible for systems design flow and test segments, must be able to translate SA requirements into feasible design. Will write complete programs specifications including flow charts showing systems linkage, data movement and resource requirements. Will also design file structures, forms, reports, and procedures for data collection, processing and control. Needs 2-4 years college plus minimum 4 years experience in programming and systems.

Positions with one of our operating divisions located in the beautiful valley area of Appleton, Wisconsin, offers excellent salaries, top benefits including liberal relocation assistance. For prompt, confidential consideration, send resume indicating salary history and current requirements, to:

Manager, Corporate Recruiting
HAMMERMILL PAPER COMPANY
Box 1440, Erie, PA 16533
An equal opportunity employer M/F

HAMMERMILL PAPERS

SYSTEMS PROJECT LEADER

Diversified NYC communications company with IBM 370/158 OS/VS. 3+ yrs exp. as project leader to design, implement & modify business systems. Potential packed opportunity in the greatest city in the world! $24,000 FEE PAID.

ROBERT HALF
PERSONNEL AGENCIES
522 Fifth Ave.
New York, N.Y. 10036
(212) 221-6500

HOSPITAL COMPUTER SYSTEMS
Implementation and Education

Hospital Corporation of America is seeking an individual to be responsible for maintenance of the continuing education process in support of the implementation of our computer assisted Administrative Systems.

The combined background of instructional design for computer systems in a health care environment is preferred. Skills in marketing and documentation are also desired. Resumes should be sent to: Thomas Bain, One Park Plaza, Nashville, TN 37203

Equal Opportunity Employer

GCOS SPECIALIST

Telecommunications Consulting

$26,000-$32,000

Exeter Associates
Executive Recruiters
Bruce A. Montville
P.O. Box 623
Computer Park
Hampton, N.H. 03842
(603) 926-6712

Highest-level Programmer/Analyst

to function as Asst. Mgr. for small dynamic Sausalito (Calif.) firm. Heavy hands-on ability and COBOL required. Unsurpassed situation for EXCEPTIONAL individual in unique environment.

CW Box 1557
797 Washington St.
Newton, MA 02160

DATA PROCESSING

IBM 370
SYSTEM ENGINEERING SPECIALISTS
SENIOR SYSTEM ANALYSTS

Dynamic expansion of our overseas business areas has created immediate ground floor opportunities for IBM 370 experienced systems professionals to provide direct System Engineering support to Division Marketing and Business Acquisition personnel relative to application of Division's on-line Logistics Management/Inventory Control Systems to customer IBM 370 data processing environments.

REQUIREMENTS:

B.S. in Engineering, Mathematics, Computer Science.

Four to eight years experience in design/implementation of on-line Data Communications/Data Base Systems utilizing IBM 370 computer equipment and 3270 display terminals.

Internals working knowledge of following IBM system software is mandatory:

- DOS/VS
- CICS
- 3705 NCP
- DL/1
- VSAM

Above positions offer excellent salary, opportunity for foreign travel and one of the most comprehensive benefits packages in the industry. To arrange for an interview, send resume including salary history to Mr. William P. McGee.

Ford

Ford Aerospace & Communications Corporation
ENGINEERING SERVICES DIVISION
3900 Welsh Road
Willow Grove, PA 19090
An Equal Opportunity Employer M/F

EDP Executive

Established market research supplier requires proven manager with substantial service bureau or similar experience to head large and growing processing division. Midwest urban location. Highly attractive compensation package. Write in confidence to:

CW Box 1556
797 Washington St.
Newton, Mass. 02160

An Equal Opportunity Employer M/F

last of the big time splendors

MONTANA

The State of Montana, Information Systems Division, located in Helena, Montana, is seeking experienced senior analysts. Positions are available for:
Supervising Systems Analysts-$17,672
Programmer/Analysts III -$16,138
Background should include systems design and project management experience on large business data processing systems using top down phased development. ANS COBOL, CICS, VSAM and IDMS data base experience also helpful. We are a dynamic shop utilizing an IBM 370/158 OS/VSI. Helena, located at the foot of the Rockies, offers clean air, friendly people (33,000) and wide open spaces. We are only 20 minutes from excellent hunting and trout fishing, river floating, water skiing, national forests and wilderness areas, and only a half-day's drive from Glacier and Yellowstone National Parks.
If you are interested in an exciting career and beautiful surroundings, please forward a resume including salary history to:

TRISH MOORE
PERSONNEL OFFICER
DEPT OF ADMINISTRATION
ROOM 101, MITCHELL BLDG
HELENA, MT 59601

Montana is an equal opportunity employer

ANALYST/ PROGRAMMER

M.I.S. International, Inc., an international computer systems integration company, needs specialized professionals for Michigan, Ohio and Indiana branches.

- **Business system analyst/programmers with experience in COBOL, PL/1, IMS, DMSII, IDS.**
- **Real time analyst/programmers with experience on micro/mini computers.**
- **Engineering analyst/programmers with time sharing experience.**

Experienced men and women interested in furthering their career should consider M.I.S.'s top salary structure, stable employment environment, fully paid fringe benefits, educational opportunity and relocation allowances. You are invited to call or send your resume to Mr. Gene Bryant.

M.I.S. INTERNATIONAL, INC.
31350 Smith Road
Romulus, Michigan 48174
(313) 326-7010

PHILADELPHIA

DIVISIONAL EDP MANAGER
To $35,000

Prestige spot w/PHILADELPHIA area FORTUNE 500 MFGR. Report directly to President. Must be multi-faceted EDP pro w/proven mgmt track record & 5 yrs MFG SYS design & implementation. Knldg lge scale BURROUGHS SYS highly pfd. Direct activities of 4 nationwide plants. DEGREE ESSENTIAL.

For confidential attention, please call or forward resume to:

ROBERT HALF
PERSONNEL AGENCIES
2 Penn Center, Suite 706
Philadelphia, PA 19102
(215) 568-4580

Programmer/Analysts

Our firm specializes in the recruitment and placement of data processing personnel. Current need exists for qualified persons with minimum 2 yrs. experience in programming and/or systems design. Background in manufacturing, banking or insurance applications highly desirable. Qualified individuals are invited to submit resume, including salary history and geographical preferences, to: EXECUTIVE RECRUITERS INTERNATIONAL, Personnel Consultants, 4101 Medical Parkway, Suite 204, Austin, Texas 78756 or call (512) 454-5247 for additional information. All fees assumed by employers.

position announcements | position announcements | position announcements | position announcements | position announcements

APPLICATIONS PROGRAMMER/ANALYST

If you are seeking a permanent position involving the development of financial, student accounting, CAI, personnel, and library applications in a small college environment, this is the position for you.

Preference given to applicant experienced on DEC PDP 11/40 with RSTS/E, BASIC programming, and a BS degree with emphasis in data processing or computer science. Competitive salary and fringe benefits. RPG II and systems programming a plus.

Applications accepted through May 31, 1978. Employment date July 1, 1978. Send confidential resume to:

Howard B. Kipple, Director
Computer Center

NEW MEXICO JUNIOR COLLEGE
Hobbs, NM 88240 (505) 392-6526, Ext. 285

NCR PROGRAMMER

Progressive bank service firm in South Florida is seeking a programmer with NEAT/3 and CIF experience. Interested applicants send resumes and salary requirements to:

American Bancservice Corp.
7479 Central
Industrial Drive
Riviera Beach, Fla. 33404
(305) 848-9778

PROGRAMMER

2-3 yrs experience in COBOL. Knowledge of BAL, FORTRAN in medium to large scale system, JCL desirable. Excellent starting salary and benefits.

Call (201) 645-5131
between 10 & 6 for appt.

N.J. INSTITUTE
OF TECHNOLOGY
323 High St.
Newark, N.J. 07102
Affirmative Action &
Equal Opportunity Employer

Computer Analyst

A Bachelor of Science degree in computer science or related field is required. 1 to 3 years experience desirable. Must be proficient in advanced FORTRAN and have some experience in an assembler language. Will be responsible for creation of new software and maintenance of existing application program on a real-time digital computer system. Software deals primarily with electric power system monitoring and control, energy production, and accounting. Utilize remote batch and local time sharing computer facilities to accomplish duties. This career position is in our production control center in Niagara Falls New York.

We offer an excellent starting salary, comprehensive benefits and opportunity for personal and professional growth.

Send resume in full confidence to:
Attnention: E.F. Bridler

POWER AUTHORITY
OF THE STATE OF NEW YORK
P.O. Box 277 Niagara Falls, New York 14302

Equal Opportunity Employer M/F

Data Processing Sales Openings

Boston - North Jersey - Philadelphia
Washington - Baltimore

If you are an established sales representative with a successful track record ...

OR

If you are the type of individual who has done it all in the Data Processing field and would now like to try a future in the marketing end of the business ...

CONTACT US

DASD, an independent Data Processing consulting firm, with offices located Nationally, is seeking several people to join its sales force in the above branches.

If you are interested in a highly successful, people & career oriented company, please forward a copy of your resume immediately to:

DASD CORPORATION

PLYMOUTH PLAZA SUITE 205
580 WEST GERMANTOWN PIKE
PLYMOUTH MEETING, PENNSYLVANIA 19462
215 - 828 - 7050
An Equal Opportunity Employer, M/F

Systems Programmer III

NMSU Computer Center is seeking a SYSTEMS PROGRAMMER III, starting June 1, 1978. Current configuration is IBM 360/65 running OS 21.8, HASP, and APL. NMSU is currently evaluating a system upgrade. Experience with OS required and Bachelor's degree desirable. Application deadline — May 16, 1978. Send resume and salary requirement to R. Waugh, Computer Center, Box 3AT, Las Cruces, New Mexico 88008. For further information call (505) 646-2226. NMSU is an Equal Employment/Affirmative Action Employer.

Analyst/ Programmer III

for N.C. State University Research and Development organization. Minimum requirements: four year degree in computer science or related field plus three years experience in analysis and programming. MIS, proposal writing, equipment evaluation and acquisition experience desirable. Interested applicants should contact N.C. State University Personnel, Primrose Hall, Raleigh, North Carolina, 27607, (919) 737-2135.

Data Processing Forecast Administrator

Weighty data processing background? Heavy administrative experience? Want to grow professionally?

Aetna Life & Casualty has an immediate opening for a Data Processing Forecast Administrator. You'll direct the collection, analysis and validation of forecast data from Corporate areas. Communicate forecast information to users of this data. And relate projected requirements to current processing capacity.

Must have working knowledge of IBM 370/168, IBM 370/168/AP, Amdahl V6-11, and supporting medium and small scale computers. Must be able to deal with all levels of management and technical personnel.

Salary range $20,000 - $24,000. Send resume to T. Kono, Employment Office, Aetna Life & Casualty, 79 Farmington Avenue, Hartford, CT 06156. An equal opportunity employer.

Aetna LIFE & CASUALTY

SYSTEMS ANALYST

CALDOR, one of the country's fastest growing Department Store Chains, is seeking an EXPERIENCED Systems Analyst, who will enjoy challenging work plus continued technical and professional growth in a progressive NCR Criterion 8570 environment. Your resume will be carefully considered if you possess the following qualifications.

—Five years of EDP experience, including ANSI COBOL, and-or NEAT-3 programming and 2 years of Systems Analyst work.

—Strong analytical disciplines, proven oral and written communications skill and project management abilities.

—A college degree and applications development experience with financial, inventory control, and data communications projects will strengthen your qualifications. Retail experience preferred.

Salary will be commensurate with experience. Please send your resume and salary history to:

CALDOR
Employment Manager
20 Glover Avenue
Norwalk, Conn. 06852

Senior Systems Programmers

If you're an aggressive problem-solver, General Electric will offer you the opportunity to work with shared Dasdi, TSO, TCAM and Data Base in an expanding, state-of-the-art Computer Center - located in a pleasant Northern Virginia suburb, near Washington, D.C.

All positions require 3-5 years of experience, a background in a large IBM MVT or MVS environment, and in-depth knowledge of OS/MVT and HASP internals. The ability to read and interpret "stand alone" dumps, apply PTF's, and conceptually handle complex hardware configurations is also essential.

We'll provide commensurate salary and comprehensive GE benefits along with the kind of exposure needed for long-range professional development and growth. Send resume including salary history, to: Ms. Mary Nofsinger, GE Company, 1755 Jefferson Davis Highway, Arlington, VA 22202.

GENERAL ELECTRIC

An equal opportunity employer M/F

INTERNALS

OS MVT SYSGEN $22M
1 yr. exper. needed-will train on 370/k68 MVS internals.

VM INTERNALS $26M
TSO $25M
Seek internals of TSO- on IBM OS

HARD. ANALYST $27M
2 yrs. NCP - 3705 network design.

CDC SCOPE $26M
Needs KRONOS-Accept SCOPE Exper

PERFOMRANCE ANALYST $24M
Seek exper. using probe & Exits

CICS GEN'S $26M
Must be able to write effectively and prefer OS internals exper.

EDP AUDITOR $15-42M
We have over 80 openings.

EXEC 8 ..... $25M
Customer Interface position desires 2+ yrs. exper. on 1100.

NJI or NJE $25M
NJI/NJE and any OS exper. needed.

DOS to OS $18M
Seek person to be Mgr. in 370/148 Shop. Must Sysgen Sys.

DOS-CICS

We have over 50 openings for Internals exper. Mini, Honeywell and others. Call Skip.

EDP SEARCH
P.O. Box 12566
Okla City, OK 73157
(405) 525-8833

SOFTWARE PROFESSIONALS

Systems programming & analysis. Provide technical support to financial/marketing areas. Prefer multi-processing PDP-11 bkgd. $18-$22,000.

Software Design and Implementation of Telecommunications systems. Develop programs which automate the generation of DB contents/370 environment PL/1. $25,000 plus.

Microprocessors development/implementation of real time multitasking operation software for mini-micro computers to $25,000.

Other intermediate and senior positions available NATIONWIDE. To arrange confidential interview, call COLLECT, (203) 249-9177. Or please send your resume to Joseph Miglizzi, CEC.

availABILITY

750 Main Street
Hartford, Conn. 06103

position announcements | position announcements | position announcements | position announcements | position announcements

EDP APPLICATIONS PROGRAMMER III

State of Arizona

Enjoy the warm relaxed lifestyle that only Phoenix can offer, with it's year-round sunshine and recreation facilities. 3 immediate openings. 2 positions open for applicants who possess 4 years of digital computer programming experience with substantial background in COBOL on a Honeywell 6000 system. 1 position open for applicants who possess 4 years of digital computer programming experience with a background in Honeywell 6060/IDS Data Base and teleprocessing communication related software. Salary range: $15,637-$20,558. Send resumes, indicating position applied for, before May 8 to: R. Gonzales, Employment Section, State Personnel Division, State of Arizona, 1831 W. Jefferson, Phoenix, Arizona 85007; or call (602) 271-3401.

SYSTEMS PROFESSIONALS

NATIONWIDE SERVICE

Proj Mgr — **To $30K**
Midwest $500+ mill corp mfg/ fincl 370, hdqtrs

Supv, Sys & Prog — **To $27K**
Mfg systems, OS-370 Southwest corp.

Grp Sys Mgr — **To +32K**
Northeast bill $ corp 370 RJE; #1 MIS in subco.

Relocation & Fees Paid by Client Co.

FORTUNE
DIV FORTUNE PERSONNEL AGENCY
505 5th Av. NYC 10017
(212) 682-8600
Company Inquiries Invited

DALLAS

E. Texas Mgr $18-22K
System/3 Mod. 15 CCP
Oil/Gas Mgr $35-40K
IBM 370 DOS/VS
P/C Ins. Sft Mgr . . $38-45K
IMS OS/MVS, IBM 3032
Ins Prog $18-20K
COBOL 370/OS VS

Suite 1109, Stemmons Tower W. Dallas, TX 75207, (214) 637-6360

FT. WORTH

IMS Anal $22K
Oil Co, new to IMS
Sr Sys Anal $26K
Degreed w/Data Base
Sys Prog $23K
DOS/VS, VSAM
Prog/Analysts $23K
Bking, Ins. Mfg.

Suite 911, One Summit Ave. Ft. Worth, TX 76102, (817)336-4565

HOUSTON

THE FASTEST GROWING DP MARKET IN AMERICA!

Suite 960 E. 4615 S.W. Frwy. Houston, TX 77027, (713)960-9102

KANSAS CITY

Programmer/Analysts

Numerous positions exist in KANSAS CITY for experienced OS/COBOL Programmer/Analysts. IMS or CICS and structured technologies preferred but not required. Salaries to 24K.

Shawnee Mission, 6405 Metcalf Kansas 66202, (913) 236-8288

TULSA

Excellent opportunity for an experienced OS/MVS Systems Programmer to provide leadership in installation & support of IMS, TSO, CICS. This beautiful city of 400,000 offers superior living conditions. Salary to mid-twenties.

2624 E. 21st St., Tulsa, OK 74114 (918) 747-3621

DATA PROCESSING CAREERS, inc.
Personnel Consultants

PROGRAMMER

Successful candidate should have 3-5 years experience with scientific language and Fortran programming (also exposure to top down structure techniques). Ability to work with Engineering staff in formulating program based on engineering and systems requirements is essential. Will development innovative aircraft monitoring systems on sophisticated real-time distributed microcomputer network.

Excellent working conditions in an attractive suburban location. For consideration please send resume with earnings history to: RALPH HOLTERMANN

CONRAC
32 FAIRFIELD PLACE
WEST CALDWELL
NEW JERSEY 07006

Systems-East Division
CONRAC CORPORATION

An Equal Opportunity Employer M/F

SOFTWARE ENGINEERS

At E-Systems, you can build a career with one of the fastest growing internationally known corporations. If you would like to change your job to a career, our Garland Division in Dallas, Texas is looking for Software Engineers with the following qualifications:

- Experience in systems architecture and design, software development, and systems integration, test, and implementation of computer based systems using DEC PDP-11 series computers utilizing the RSX-11 D/M or IAS operating systems.
- Experience in data base management architecture and design, utilizing Fortran or assembly language to interface with Total, IDMS, or similar DBM systems.

E-SYSTEMS
Garland Division
An equal opportunity, M/F employer

If you qualify, send your resume to:
Employment Manager
E-Systems
P.O. Box 226118
Dallas, Texas 75266

SYSTEMS PROGRAMMER

Pennzoil Company, a domestically oriented natural resources company based in Houston, has immediate openings for Systems Programmers with experience in SVS/HASP or MVS/JES 2 and related software. Experience in DB/DC, computer performance analysis and technical evaluation of hardware and software proposals is highly desirable.

If you are seeking a progressive, stimulating working environment as well as outstanding opportunities for training on the latest software and hardware, contact us.

Pennzoil offers a full range of benefits as well as excellent career opportunities for the innovative professional. Resumes may be sent in confidence to:

C.K. Lagarde (CW)
P.O. Box 2967
Houston, Texas 77001

An Equal Opportunity Employer M/F

PENNZOIL COMPANY

PROGRAMMER/ANALYST

$15,732--$19,176

Exciting opportunity now exists for an experienced Programmer/Analyst. New Burroughs B-1700 system will be used as a stand alone system and an RJE to a B-6800. Successful candidate will assist in the design, implementation and maintenance of on-line administrative, student and financial systems. A minimum of two years of experience including COBOL programming and system analysis & design. Experience with Burroughs hardware/software desirable. Excellent fringe benefit package. Contract Charlie Perry, Classified Personnel Director, Rialto Unified School District, 182 E. Walnut, Rialto, Ca. 92376, (714) 875-3000, Ext. 303.

DATA PROCESSING MANAGER

Give your originative ability an invigorating breath of fresh air!

Our client a leading coastal Northwest manufacturing company has made a heavy commitment to enlarging its computer center. Here's a superb environment for the professional who thrives on the pleasures of outdoor living as well as the satisfaction of developing programming innovations, along with handling ongoing systems and operations-staff responsibilities.

An aggressive, resourceful self-starter will be best for this position - requiring proven technical and managerial skills. Minimum 3 years systems analysis experience in business applications, plus system 3/RPG II knowledge a must. On line development using CCP desirable.

Outstanding salary and comprehensive benefits. Exceptional opportunity for advancement. For immediate consideration, forward resume with salary history and current requirement to:

john sutton associates
search consultants, inc
Dept. 036
101 Park Ave., New York, N.Y. 10017
An equal opportunity employer M/F

SENIOR SYSTEMS ANALYST/ PROGRAMMER

Applicants must demonstrate the ability to confer with managers, scientists, engineers and graduate students in order to define business or scientific/engineering data processing problems, formulating statements of these problems and devising solutions. Requirements include a BS or MS degree in Science or Engineering, with a strong background in Mathematics and Statistics. Applicants should have 5-10 years computing background, including academic experience, with broad computer exposure in the areas of time sharing and batch. Experience in FORTRAN is required, PL/1 and some BAL desired. Salary open, and dependent upon qualifications and experience.

Send complete resume to:
Director of Personnel
The Institute of Paper Chemistry
P.O. Box 1039
Appleton, Wis. 54912

An equal opportunity employer M/F

BASIC/FOUR MIAMI/FT. LAUDERDALE ANALYSTS AND PROGRAMMERS

Computer Management Systems, Inc., the BASIC/FOUR dealer in the Miami/Ft. Lauderdale area is looking for qualified and experienced professionals to complement our systems and programming staff.

BASIC language and experience with accounting applications are highly desirable.

We are a rapidly expanding company offering ground floor opportunities and a variety of interesting and challenging assignments.

Salary commensurate with experience. Contact or send resume to:

COMPUTER MANAGEMENT SYSTEMS, INC.
1525 N.W. 167th St., Suite 420
Miami, Florida 33169
(305) 625-0531

Programmers-Analysts

Maximize your opportunities . . .

. . . take advantage of the most individualized job search available in the D.P. industry today. You pay absolutely NO fee for our service. We search out the best opportunities nationwide to fit your earnings & growth potential with respect to your location requirements. In confidence, send us your resume with present salary & geographic preference. Let us maximize your opportunities.

SEARCH E.D.P., INC. 3152 Linwood Ave. Cinti. Oh. 45208

position announcements | position announcements | position announcements | position announcements | position announcements

AUBURN UNIVERSITY AT MONTGOMERY
FACULTY POSITION
DEPARTMENT OF INFORMATION SYSTEMS AND QUANTITATIVE METHODS
SCHOOL OF BUSINESS

QUALIFICATIONS
Earned Doctorate in Information Systems and/or Computer Science with strong business and quantitative background. Qualified persons will be considered for departmental chairmans position. Will consider all applicants including ABD's for faculty position.

SALARY AND RANK
Salary is competitive. Salary and rank dependent on degree and experience.

APPLICATION
Resumes and references should be sent no later than May 30, 1978, to:

Dean, School of Business
Auburn University at Montgomery
Montgomery, Alabama 36117
(An equal opportunity/affirmative action employer)

PROGRAMMER

Immediate openings with a well established Florida firm. Two years programming experience of business applications using ANS COBOL. Exposure to a data base management system would be helpful. We are a non-food distribution company in a 370 DOS/VS environment. We offer attractive benefits and a competitive starting salary. Send resume and salary history to:

Manager of Systems and Programming
SAV-A-STOP INCORPORATED
500 Wells Road, Orange Park, FL 32073
An Equal Opportunity Employer M/F

PARS SCHEDULE CHANGE
PROGRAMMERS

Openings for Programmers at all levels with experience in the maintenance and development of PARS schedule change software.
Requirements: Minimum 2 years of experience in online and/or offline PARS schedule change programming.
Excellent benefits include free and reduced rate transportation. Salary - $15,600 - $26,000 yearly. Send resume to:

United Airlines Employment Office
7155 East 38th Avenue, Denver, CO 80207
An Equal Opportunity Employer

Visiting SAN FRANCISCO???

Let us help you combine a selective job search with your vacation!!!

ASSEMBLY LGE APPLICATIONS PROGS IBM 370
For on-line CRT "Light Pen" medical systems. Many positions.

COBOL PROGS
With one or more years exp. Our clients will train you in IBM 370/OS/IMS on-line, teleprocessing environments. Salary varies with exp. $16-24,000.

EDP AUDITORS
Several senior positions in Manuf., Insurnace, Banking, Distrib.

CONSULTANT
Software/Systems Analyst for prestige Financial District group. Prefer IBM 370/OS Assembly lge. Some supervisory. Install on-line package.

ROBERT HALF PERSONNEL AGENCIES

Jerry Anderson
111 Pine St.
San Francisco, CA 94111
(415) 434-1900

Stan Ings
2 Palo Alto Sq.
Palo Alto, CA 94304
(415) 493-8700

CAREER SALES

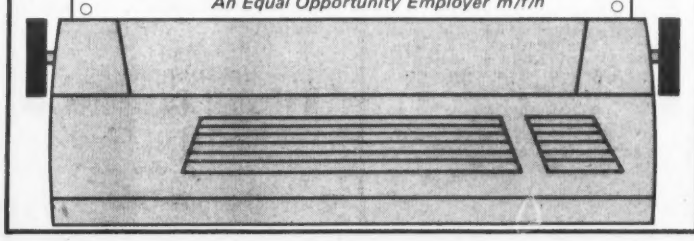
If you have a strong background in Data Processing Sales, preferably Data Communications, TRENDATA CORPORATION is ready and interested in hearing from you.

We need qualified sales representatives and sales managers to fill several new positions throughout the country.

In return, we're offering you a long term, financially rewarding career opportunity, an excellent company benefits program, and outstanding growth potential.

Applicants should send a detailed resume to Lois Coli, Personnel, Trendata Corporation, 610 Palomar Avenue, Sunnyvale, California 94086, or call (408) 732-1790.

Applied Magnetics Trendata
An Equal Opportunity Employer m/f/h



MANAGER, INFORMATION SYSTEMS

DENVER

The Regional Transportation District requires a Manager, Information Systems. Will have full responsibility for the study, design and implementation of all RTD information system development and for the operation of computer processing facilities.

Must have Bachelor's Degree in Accounting, Finance or Computer Science and be thoroughly familiar with accounting and reporting systems. Must have extensive EDP and MIS experience both at the working and management level. Must provide demonstrated success in the management of major system design and installation on current generation equipment, including direct supervision of technical personnel.

Starting salary $25,000-$29,000 and fully paid employee benefits.

To apply or further inquire, contact:

Brigitte Malcolm,
(303) 759-1000, Ext. 472
Or send resume to:

REGIONAL TRANSPORTATION DISTRICT
Personnel Div.
1325 South Colorado Blvd.
Denver, Colo. 80222
An Equal Opportunity/ Affirmative Action Employer

SOFTWARE PROGRAMMER

Local area bank seeks 370 DOS/VS Assembler software programmer. Must have banking and on-line expr.

ROBERT HALF
PERSONNEL AGENCIES
P.O. Box 3320
2201 San Pedro NE
Bldg. 2, Suite 228
Albuquerque, NM 87110
(505) 266-5557

JOB SEEKERS !

Start Your Own Company!

The newly published "How to Start Your Own Minicomputer Business" is written by a trained computer professional from practical experience. Not a franchise plan, not a wild scheme, but simple step-by-step instructions on how to begin your own enterprise. Send $10 to: Handbook, 39 Country Club Rd., Carlisle, PA 17013.

The billion-dollar connection.

The National Minority Purchasing Council offers a simple folder that tells you how to connect with our computerized directory of more than 10,000 minority-owned firms. Best connection a corporate purchasing manager could have. Consider the source.

The National Minority Purchasing Council is a not-for-profit corporation formed to promote increased purchases from minority-owned firms. Chief executive officers of about a thousand major corporations actively support its efforts, with the practical result that purchases by its members are up from $86 million in 1972 to $1 billion in 1977. And we've only just begun—all we need is more top-level connections.

Call (202) 466-7077, or write: National Minority Purchasing Council, Inc., 1925 "K" street, N.W., Washington, D.C. 20006.

National Minority Purchasing Council, Inc.
Our strongest recommendation is a business recommendation
A Public Service of This Magazine & The Advertising Council

MEDICAL INFORMATION SYSTEM DEVELOPMENT
PROGRAMMER/ANALYST

A Research Institute at the Indiana University Medical Center (Indianapolis) is seeking a bright and dedicated Programmer/Analyst to join in the development of a medical information system with national significance. Work involves networking, transaction processing and the development of an in-house data base system and an automated medical decision-making system. Applications extend to the clinical lab, the pharmacy, the medical record and the operation of the medicine clinics. Opportunity for strong interaction with users and responsibility for major application systems from design through implementation.

Position requires B.S. in Computer Science or equivalent technical degree and one to three years of employment as a Programmer/Analyst. Experience in the development of data management systems and/or PDP 11 RSTS, BASIC PLUS and/or RSX 11-M desirable. Experience with medical applications not needed.

Salary depends upon qualifications and experience. Please send resume (if possible, transcript) to Mrs. Joanne Lepper, 1001 West 10th St., Indianapolis, Indiana 46202.
An equal opportunity employer M/F

THE CONNECTICUT STATE COLLEGES

A Position in the Central Executive Office

DIRECTOR OF MANAGEMENT SYSTEMS

Applications and nominations will be accepted up to and including May 31, 1978. Send applications and nominations to Miss Elizabeth A. Higgins, Associate for Board Affairs, P.O. Box 2008, New Britain, CT 06050
An Equal Opportunity Affirmative Action Employer

SYSTEMS CONTROL ANALYST

A Fortune 500 Company headquartered in Boston seeks an individual for a position on its EDP audit staff. The position assists in the development and implementation of various audit applications as they relate to the specific EDP systems of this diversified energy company. Candidates should have a Bachelors degree with a minimum of 2 years programming experience and knowledge of accounting/auditing principles. 30-50% travel required. Mail your resume, including salary history in confidence to:

CW Box 1551
797 Washington St.
Newton, MA 02160
An Equal Opportunity Employer M/F

PROGRAMMERS

Are needed for nuclear and other energy-associated programs in Oak Ridge, Tennessee.

Engineering, Computer Science, or Mathematics graduates with two-to-five years' experience in machine language programming of general purpose computers. Applications include data acquisition, machine control, and scientific data analysis.

Computer Science or Mathematics graduates for programming scientific and business applications in FORTRAN, PL1, and COBOL. Experience desired.

U.S. Citizenship Required - Relocation Expenses Paid.

UNION CARBIDE

Send resume to:
Central Employment Office
Union Carbide Corp.
Nuclear Division
P.O. Box M
Oak Ridge, Tenn. 37830
An Equal Opportunity Employer

WESLEYAN UNIVERSITY
DEC-system-10/20
SYSTEMS DESIGNER

Wesleyan University is seeking a systems designer to maintain and extend system software on a DECsystem-10 computer. The successful candidate will have primary responsibility for system support. Applicants should have a master's degree in Computer Science or a bachelor's degree with at least 3 years of systems-level experience. Salary to $17,000 per year, based on experience, with fringe benefits, and liberal vacation.
Applicants should forward resumes to

H. David Todd, Director
Computing Center
Wesleyan University
Middletown, CT 06457

Wesleyan University is an Equal Opportunity/Affirmative Action employer and actively solicits applications from women and minority group candidates.

NORTHEAST U.S.
AND
S. CENTRAL U.S.
COMM'L MINI SYSTEMS
$18K+ COMM = $30's
3 yrs minimum exp new accts, EDP acctg & business systems. Sell total hard/software packaging to insurance, banks, retail & public utilities. For established progressive co. 5-6 states for each location.

ROSS Personnel Agency
20 Route 110
Melville, L.I., N.Y. 11746
(516) 549-5656

Systems Analyst

Northern California Equal Opportunity Employer is seeking a systems analyst for its expanding Data Processing Department. Major emphasis will be develop communications system application software for a utility company. Prior programming and systems design experience are required. Knowledge of multiprogramming on a Univac disk operating system is a plus.
Send resume to: Personnel Coordinator, P.O. Box 2218, Redding, California 96001.

position announcements | position announcements | position announcements | position announcements | buy sell swap

DATA PROCESSING MANAGER

Requires any combination of ed., and exp. in Data Processing equiv. to completion of 4 yrs. college and approx. 4 yrs. responsible exp. in data processing. $21,780-$26,472 annual salary, plus fringe benefits. Contact: Cabrillo College, Personnel Department, 6500 Soquel Dr., Aptos, CA., 95003, or phone: (408) 425-6219. Apply by May 16, 1978.

An E.O./A.A. Employer

DATA BASE ADMINISTRATOR

Progressive suburban research firm seeks exp'd. administrator to implement engineering & data base software. Min. 2 yrs. exp. w/FORTRAN or PL/1. Familiarity w/generating data base mgmt. systems req.; BS &/or MS degree preferred. Unique oppty. to apply DB mgmt. techniques. Salary to $30,000. (Fee Paid.)

Contact Gerry Battista,

ROBERT HALF PERSONNEL AGENCIES

140 Federal St.
Boston, Mass. 02210
(617) 423-6440

Making Machines Do More So Man Can Do More

SPERRY UNIVAC a world leader in the computer industry, has career opportunities for individuals with experience in the areas of:

Data Base Management

(DBMS, DMS 1100, System 2000, etc.)

Transaction Oriented Systems

1100 OS

(IMS, TIP 1100, etc.)

(EXEC 8)

Applicants should have 1-3 years systems experience. Positions are available in the middle Atlantic, New York Metropolitan and Northeast areas of the U.S.

For immediate consideration, submit your resume in strict confidence to:

SPERRY UNIVAC
Professional Employment
480 Swedesford Road
Wayne, Pennsylvania 19087

An Equal Opportunity Employer M/F

BUY-SELL-SWAP

Programmers

BUSINESS SYSTEM PROGRAMMER

Great opportunity on a quality, inexpensive micro-based Business System sold by exclusive stores, maintained by national service group. Candidates must have a degree with 3-5 years experience programming business systems on mini or microcomputer hardware.

Pertec Computer Corporation employees receive outstanding benefits including life, medical, dental insurance, long-term disability insurance, stock purchase plan, profit sharing/retirement plan, tuition refund, and up to 25½ paid days off per year. Please send resume or call:

(213) 999-2020
9601 Lurline
Chatsworth, CA 91311

Equal Opportunity Employer M/F

PCC MICROSYSTEMS
a division of Pertec Computer Corporation

SALES DATA TERMINALS

Sykes Datatronics, Inc., the leading manufacturer of intelligent diskette based data terminals is expanding its direct sales force.

IF YOU

- Have a proven record selling data terminal products in the large end-user market.
- Are a self-motivated individual who can manage your own office and large geographic territory.
- Are comfortable dealing with FORTUNE 500 corporate managers.

WE OFFER

- Outstanding base salary
- Incremental commission plan (up to 7%)
- Bonuses
- 150% Club
- Car Plan
- Paid Expenses
- An opportunity to earn $50K plus per year

Offices are being established in: Phil, NJ, NY, Wash. D.C., Atlanta, Dallas, San Francisco and the Midwest.

If you qualify and are interested, please forward your resume, including earnings history in strict confidence to: Mr. Larry Samartin

SYKES
SYKES DATATRONICS, INC.
375 ORCHARD STREET
ROCHESTER, NEW YORK 14606
716-458-8000

An Equal Opportunity Employer

COMPUTER SCIENCE

Regular tenure-track position available September 1, 1978. Doctorate in computer science preferred; doctorate in mathematics plus masters (or equivalent) in computer science acceptable. Teaching experience at college legel desired. Department program includes majors at both undergraduate and graduate levels. Send resume, at least three letters of reference, and academic record in computer science and mathematics to Duane E. Deal, Chairman, Department of Mathematical Sciences, Ball State University, Muncie, IN 47306. Application deadline May 31, 1978.

Ball State University Practices Equal Opportunity in Education and Employment.

SR. EDP AUDITOR

Conn. corp. has immed. opening due to promotion for indiv. w/lge. mfg. & EDP bkgrd. Indiv. will initially travel to 40%. Provide audit support to corp. mgmt. Very visible, promotable position. Starting salary to high $20's. (Fee paid.) Contact Stan Durbas.

ROBERT HALF PERSONNEL AGENCIES
111 Pearl St.
Hartford, Conn. 06103
(203) 278-7170

FOR SALE

3275-2 Display Stations
3286-3 Printers
3283-3 Printers
50-70 Available Now - July 1
Call or Write
(714) 833-9800
TWX 910-595-2550
SADDLEBACK MARKETING CORP.
1401 Dove Street, Suite 245
Newport Beach, CA 92660

Member Computer Dealers Association

PROGRAMMER/ ANALYSTS

Scientific Programming Minis to $28,000

Fortune 100 Co. seeks career oriented people w/bkgd in assembly/PL I, Macro/Real Time is a plus, Message of Packet Switching Also: seeking Computer Test Engr's with assembly language.

Call or Send Resume to:

ACCURATE PERSONNEL
(212) 233-7770
150 Bway, Rm 1802
New York, N.Y. 10038

CENTRAL WASHINGTON UNIVERSITY

Computer Center
SYSTEMS ANALYST/ PROGRAMMERS

CWU has openings for two System Analyst/Programmer II's and one Systems Analyst/Programmer I position with major responsibilities in the development of new applications software utilizing extended basic on a PDP 11/45 supporting 30 terminals and OS COBOL on a remote AMDAHL 470/V6 support site.

CWU is a pioneer in large scale networking and local interactive mini support for on-line student registration.

Minimum qualifications for the SA/P II positions are one year experience in programming and analysis or a Bachelor's degree in job related area. The SA/P I position requires High School graduation or GED and proficiency in COBOL or Basic-plus.

Applications must be postmarked by May 19, 1978. For application and further information contact Donald Clark, Director of Computer Services, Central Washington University, Ellensburg, WA 98926, or call (509) 963-2921. EEO/AA/TITLE IX Institution.

DATA BASE ANALYST/DESIGN

Mid $20's. Fortune 100 client seeks individuals able to contribute to the team supporting IMS Data Base Systems. Requirements: 3+ yrs intensive DB experience; IMS; COBOL. Excellent growth & technical challenge in one of the most sophisticated IMS shops in the country. Lower Mid-Atlantic location.

MFG CONSULTANTS

$28-32,000. Prestigious national data services company seeks individual able to recommend solutions to complete mfg problems. Requires 5+ yrs experience in inventory control, MRP, Quality Control and Familiar with latest computer design techniques. Must also have exp calling on high level co officials. Excellent growth potential in a desirable Midwest location.

SR ANALYSTS

To $23,000. Blue chip Fla client seeks professionals able to define, lead & implement projects. No programming but must have Project Mgt exp. Excellent career opportunity with this growing firm located near the ocean.

SALES REPS (MINIS)

$20-22,000 base. $35-40,000 possible first year. Prestige blue chip client seeks mini-computer repts. SUpplentary income (not a draw) while training. Must have 3-5 yrs EDP sales background. Degree preferred, familiar with minis. Rewarding career opportunities in Atlanta & other desirable S.E. locations. Minimum travel.

Above represents a partial list of active nationwide searches. All costs paid by hiring companies. Send resume in confidence, including current salary and geographic requirements, to Ron Spang (404/393-0933), specialist with "hands-on" EDP experience.

FOX-MORRIS PERSONNEL CONSULTANTS
47 Perimeter Ctr. E., N.E.
Atlanta, GA 30346

FOR SALE

IBM MEMORY

370/158 IK Memory (1536K)
370/168 2nd, 3rd, 4th Megabytes

Call
Ken Gilmore
(213) 777-4070

NEW MAG TAPE
$9.50
100% CERTIFIED 2400'
Five Year Guarantee
Call Your TRI Distributor

LOCATION	PHONE
New England	617-749-5800
Washington, D.C.	703-938-5950
Ohio	216-226-1311
J.J. Data (Il)	312-695-4040
T.M. Cptr (Chi)	312-485-8100
Pittsburgh	412-341-2001

TRI 312-428-4444

FOR LEASE

370/158-2 megabytes system with/ISC
370/168-4 megabytes system with/ISC

Contact
T.J. McArdle
National Computer Rental, LTD
N.Y.C., NY
(212) 532-1500

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

370/158-3

With AP
4 Meg
Available-July

FOR SALE

Computer Properties, Inc.

5200 West 73rd St.
Minneapolis, MN 55435
(612) 831-6088

FOR SALE

NCR

621-101

Comm. Multiplexor
With
692-100
Character Adapter
Contact: Rick Graves
313-588-2200

FOR SALE

One H.P. 2000C',
S/N 0934 With
2766A Disc Memory

Machine will remain operational until April 21, 1978. Sealed offers to purchase will be accepted until 1:30 p.m. Pacific time, April 28, 1978. A public corporation. Further information from Neil Fuller, (503) 255-1841 or P.O. Box 16657, Portland, OR 97216. Machine is offered as is, where is.

HONEYWELL-2040
Complete System
Sale/Lease
Available 12/78
Call or Write:
G.G. Mazzaferro
P.O. Box 1019
Jackson, MS 39205
601-939-4040

IBM DISK

BUY-SELL-TRADE
3830, 3330, 3340,
3350, 2314

ADTEC

COMPUTER CORP.
280 Madison Avenue
New York, N.Y. 10016
(212) 532-7590

WANT TO BUY

EMM MEMORY

Model 30,40,50,65, 155

Call
Ken Gilmore
(213) 777-4070

DEC HARDWARE
PDP 11 PDP 8
Processors Peripherals
Memories
VT52's, LA36's, LS120's, LA180's
BROOKVALE ASSOCIATES
Seekers and Sellers
(516) 585-0800

Why Comdisco is First in the Second Market:

IBM Processors available

145/148
Sale or lease
Immediately
avail.

155/158
Machines
available
now.
Sale • Lease
• Trade

165/168
Lease machines
interum to
your 3033.

3032/3033
Avail. 4th Qtr.
Lease only.

IBM Peripherals available

3420
We will purchase your 1600 BPI drives and replace with Models 4 or 6 immediately.

3830-2
3330-33
3340-A2,B2
Sale or
Lease

3420-5
With #6631
available now
Sale — Lease

3350
Want to buy
P.O. credit
machines

IBM 3031, 3032, 3033 operating leases available.

Atlanta 404/256-5956
Fort Worth 817/534-1774
Minneapolis 612/854-8107

COMDISCO®

New York 201/568-9666
San Francisco 415/944-1111
Paris, France 374-1130

9701 W. Higgins Rd., Rosemont, Ill. 60018 (312) 698-3000

Your First Choice in the Second Market

WANTED
TO PURCHASE OR LEASE.

Documented software to assist in the design of industrial electrical systems using conduit and wire. Program output should provide a listing of individual conduit runs, wire fill by quantity, type, and length plus total lengths for all conduit and wire by size and type. Please specify hardware requirements for processing the software being requested.

Address replies to The Rust Engineering Company, P.O. Box 25374, Portland, Oregon 97225 (503) 297-1671, in care of Earl Egan. Include information on input/output data, program abstract, sample of printout and price.

FOR SALE

IBM 370/158 U35 processor and memory with 4 channels and integrated storage controls. Available Sept. 11, 1978 directly from original owner. Contact Mr. George Hanna (614) 422-9113 for bid procedure. All bids due May 25, 1978.

FOR SALE OR LEASE
IBM 3277-2's with
4630 Keyboards
30 Day Delivery
Call Collect or Write
Berlent Industries, Inc.
1975 Hempstead Tpk.
East Meadow, N.Y. 11554
(516) 794-9722

Member Computer Dealers Association

LEASING
3031, 2, 3
yours or ours
370/138 thru 370/168

WANT TO BUY
370/158 370/168
Any 370 Peripherals

Computer Resources, Inc.
511 Phoenix St.
P.O. Box 527
South Haven, MI
(616) 637-8425

FREE
MINICOMPUTERS

No . . . ,but we have the next best thing! Rental of Digital Equipment Corporation (DEC) minicomputers complete with all programs required to do Order Processing (with Inventory Control and Billing), A/R, A/P, G/L and Payroll.

For further information call:

Frank Clark
Minicomputer Sales Corp.
14 West 40th St.
New York, N.Y. 10018
(212) 221-7270

370/165-II

- FOR SALE OR LEASE
- AVAILABLE JUNE 1978
- AS SHORT AS 24 MONTH LEASE AVAIL.

CALL TED MOLINARI AT:
(201) 947-4200

IPS
IPS COMPUTER MARKETING CORP.
2460 LeMoine Avenue
Fort Lee, N.J. 07024

SALE OR LEASE

135	Most Configurations	April, May
145/IH2	Short Term Lease	May
145/H2	Lease	July
145/J2	Lease	July
3830/2	New, ITC Qualified	Now
2880/2, 1862	New, ITC Qualified	June
3411/1, 7360, 3221		Now
155, 165 IBM Memory		Now

WE SHALL PURCHASE
YOUR IBM 370 EQUIPMENT
"Professionalism"

Please call Marv Berger
(800) 225 2036 or (617) 482-4671

Computer Systems of America, Inc.
141 MILK ST. BOSTON, MA. 02109

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

CMI BUY LINES

BUY-SELL-LEASE-TRADE

Call (313) 642-8000

3031/3032/3033
3031 Delivery 12/78
Marilyn Burchi

370/165 370/168
168 Available June '78
(2) Available July '78

370/158
Ron Baker

370/155
(1) Available Now!

370 148/145/138/135
(4) Available now to June

370/115/125
Call for Details

3420 3803 3333 3830 3330 3340
Darryl Hastings

1403 2821 2501 1442 1443
Joe Romeo

360 30/40/50/65
Best of Values

3270 CRT's
Printers/Controllers
1130
Jim Carleton

System/3
Model 15
Jerry Roberts

3742 3741 5496
Patti Lamia

360/20
085-083-029-059-026-129
Marie Bednarz

BUY OF THE WEEK

System 32-C44 16K
13.7 megabytes 285 ipm.
Immediate Availability.
Patti Lamia

370/155J
DAT • 3 Channels
1 Meg IBM • 3215 Console
Available Now! $575,000
Gary Smith

Want to Buy
5415 B C or D models
3411's w/system 3 attachments
Rental Credits.

NEW OPERATING LEASE PLANS
3033 3032 3031
CALL FOR DETAILS!

FOR SALE
3135 FE S/N 61060
IFA, 2 channels, console, power unit, FE to I AMS universal memory.
Available Now
3135H S/N 61290, FA, ICA, 1 channel, console, power unit.
Available Today: can reconfigure to meet your requirements.

Call (313) 642-8000

CMI CORPORATION *The IBM Specialists*
1500 N. Woodward Ave., Birmingham, Mich. 48011, (313) 642-8000

IN CANADA CALL:
Don DuPuis, Windsor, Ont., (519) 258-8910
Ron Ridding, Toronto, Ont., (416) 683-3704
Jacques Dagenais, Montreal, Que., (514) 374-5920

★
NEW DG NOVA 3/12's
WITH BATTERY BACKUP AND AUTO PROGRAM LOAD AND RESTART
NEW DG MEMORY
32 OR 16 KB
IMMEDIATE DELIVERY WITH 22% DISCOUNT
CALL CLARK & ASSOC.
(816) 741-3183

FOR SALE
IBM Model 158 Memory
K to KJ or U34 to U35
Available May
Call Anne Rhame
Commonwealth Computer Advisers, Inc.
707 East Main Street
Richmond, Virginia 23219
(804) 643-4200

SALE
ALL
IBM Unit Record Equipment
129 & 029's
East Coast (717) 564-8870
West Coast (415) 332-6265 (714) 754-7823
dpi Unit Record Leasing Company
110 HiVista Road Sausalito, Calif.
LEASE

BUY • SELL
TELETYPE
MODELS
43 • 33 • 32
NATIONAL TELETYPEWRITER CORP.
207 Newtown Rd.
Plainview, N.Y. 11803
(516) 293-0444

370-30XX SERIES UPGRADE PROGRAM

LEASE - 370 NOW, With Guaranteed Upgrade Rates on 30XX Follow On:
370 Equipment Available
With Excellent 30XX Delivery Positions
Call: Mike Swords (914) 428-5000

dpf
DPF Incorporated
141 Central Park Ave. So.
Hartsdale, N.Y. 10530

2314-B1
- Up to 9 SPINDLES
- 60 m.s. average access time
- Two channel switches available
- Immediate delivery — Sale or Lease

COMDISCO
312-698-3000

WANT TO BUY
- IBM 3420/8 Tape Drives
- IBM 3211/3811 Printer
- IBM 3333/3330 DASD
- IBM 3277 CRT's and Controllers
- IBM 370/145 - 256K or 512K

FOR SALE OR LEASE
- IBM 3420/3 & 5 Tape Drives
- IBM 370/138 J (1 year lease)
- IBM 2501 Card Reader
- IBM 3330 DASD
- IBM 2860/1 Selector Channel
- IBM 3277 CRT's and Controllers
- IPC 6780 Block MPX Channel

Call
FORSYTHE McARTHUR
(312) 943-3770
Dealer & Lessor In IBM Computers
FORSYTHE/McARTHUR ASSOCIATES, INC.
919 North Michigan Ave., Chicago, IL 60611
Member, Computer Dealers Association

BUY SELL LEASE
SYSTEM/3
Models 15, 10, 8, 6
Systems 32 & 34
All Support Peripherals
COMPUTER BROKERS, INC.
P.O. BOX 28298
Memphis, Tn. 38128
Phone 901/372-2622
Member CDA

---

dearborn giveth:

2701-1	BISYNC	dc
3330-1	Disk	
3420-5	S/D Tape	
3410-2	S/D Tape	
1288-1	Optical Scanner, (Aug. '78)	
3275-2	W/4630, 7820	
1403-N1	W/8640	
2314-1	DASD	

Telex 1 x 5 3330's for model 40 and up

dearborn taketh:

2821-6	2540 control

Call Tom Millunchick
(312) 827-9200

dc dearborn computer company | dealer-IBM computers systems software leasing

1460 renaissance dr., park ridge, ill. 60068 (chicago) 312/827-9200
toronto (416) 621-7060 • st. louis (314) 727-7272 • houston (713) 965-0788 • dallas (214) 748-0699

BUY • SELL • LEASE

026	$ 850	085	$ 750
029	1850	088	2500
059	1375	129	3350
082	800	514	800
083	1800	548	1500
084	2500	552	900
		557	2800

MOHAWK-6401-6403 NCR-736
Want to buy IBM 029's, 129's, 3741's, 3742's
COMPLETE LINE BURSTERS, SHREDDERS, DECOLLATORS AND BINDERS
ECONOMICAL LEASE PURCHASE PLANS
DP SERVICE INC.
CALL STAN PELC or NATALIE REYES
312-774-2556
5505 N. MENARD AVENUE, CHICAGO, ILLINOIS 60630

LEASE
Short or Long Term
ISS 3330 mod 1 equivalents
RANDOLPH COMPUTER COMPANY
537 Steamboat Rd.
Greenwich, CT 06820
Toll Free: 800-243-5307
Conn: 661-4200

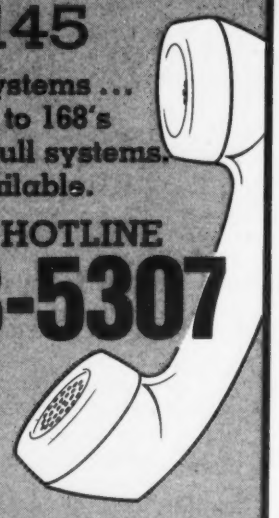
buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

Short or Long Term Leases From RANDOLPH

370/138
370/148
370/135
370/145

... and all other IBM systems ... from S/3's and 115's ... to 168's and all 303X. CPU's or full systems. Up to 8-year leases available.

CALL THE 370 HOTLINE
800-243-5307



Randolph Computer Company
537 Steamboat Rd., Greenwich, CT 06830
(203) 661-4200

LEASE SHORT OR LONG TERM HIGH SPEED I/O SETS EXCELLENT PRICES

ALBERT BERMAN
(215) 885-4990

GRANITE COMPUTER LEASING CORP.

MEMBER COMPUTER LESSORS ASSOCIATION

BENSON EAST
YORK ROAD AND TOWNSHIP LINE
JENKINTOWN, PA 19046

FOR SALE OR LEASE

360/40
384K

ALL IBM MEMORY

2821-1, 2540, 1403N1
2314-1

713-675-2661

FOR SALE
PDP11
IMMEDIATE DELIVERY
Datasystem 354

Includes:
PDP11/34, 64K, 2-RK05 Disk Drives, 1-VT52 terminal, 1-LA36 terminal, 1-LA180 Printer
Including full accounting applications software.

Also immediately available:
- PR11 High Speed paper tape reader
- PDP11/03-KA with 16K and power supply

Spiridellis & Assoc., Inc.
14 W. 40th St.
New York, N.Y. 10018
(212) 221-7270

DEC

HARDWARE
PDP11•PDP8
LSI-11's
Processors Peripherals Memories
VT52's LA36's
LS120's LA180's
Also available
Other printers and discs available with controllers for most minicomputers.

NDS
NATIONAL DATA
SALES CORP.
516/944-7444

Before you buy or sell used computer equipment consult

COMPUTER PRICE GUIDE

"The Blue Book of Used Computers"

Quarterly publication contains current price information about used IBM computers and peripherals. Includes newsletter about current price trends and availabilities.

$5 per issue – $18 annual subscription

Computer Merchants inc
75 South Greeley Avenue, Chappaqua, New York 10514
Member Computer Dealers Association (914) 238-9631

FOR SALE

NEW, UNUSED
Data General System
Nova 2/10

- 8K Core Memory
- Auto Load
- I/O Board
- Real Time Clock
- TTY I/O
- Precision Crystal Oscillator
- EIA I/O
- PT Reader I/O
- CRT D.G. 6012
- H.S. PT Reader – DG 6013
- 2-Bay, 61" Cabinet

For further information contact Tom Broyer

NORTHEASTERN TOOL CO., INC.
P.O. Box 169
Haverhill, MA 01830
Tel (617) 372-7715

DIRECT FROM FACTORY • TESTED • WARRANTED

MODEMS

Used ICC Modems at Significant Savings

Now you can buy or lease dependable ICC modems at a special low cost. We have a stock of modems, largely from customers who upgraded their data communications networks with our latest modems. These modems have been factory tested, are under warranty, and are backed by Racal-Milgo's nationwide service/support organization. Quantities are limited. Prompt action can assure you of these substantial savings.

May Special
Order now and
Save 68%
over original price on this 4800 bps modem.

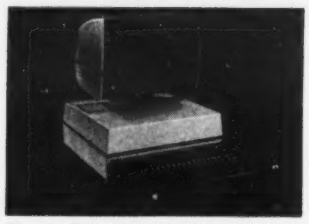
4800 bps

Modem 4500/48 is an adaptively equalized 4800 bps data set. The modem, when new, sold for $4,980; the normal Special Offer Division price is $1,795. During the month of May, you can purchase the 4500/48 for $1,595. A typical 30 month lease rate is $72/month.

The 4500/48 operates over 3002 type unconditioned lines and, for backup purposes, will operate over most dial lines in a 4-wire mode using two (2) RCD's. Multiport operation (2x2400 bps) is optional on the 4500/48. Offer expires May 31, 1978.

Conditions of Sale
1) Orders must be postmarked prior to May 31, 1978 with delivery scheduled no later than August 1, 1978.
2) Offer subject to availability of products.
3) All prices are F.O.B., Miami, Florida and do not include installation.
4) Based on ICC Terms and Conditions.

40+TK1 Data Station



The 40+TK1, a high speed direct dial data station, is now available through our Special Offer Division.

The 40+TK1 stores messages in an MOS solid-state buffer and is designed to replace low-speed, leased-line and tape oriented terminals. **(Note: The 40+TK1 can be used as a Wiltek replacement.)** Data transmission speeds range from 1200 to 2400 bps over dial up lines. The data station includes an ICC 40+ display station, keyboard, control module, printer and desk—all for the introductory price of $7,950 (original price was $14,000).

Typical Savings		Original Price	Special Price
2000 bps	**MODEM 2200/20** Economical 2000 bps on dial up or dedicated telephone lines, WE201A compatible.	$1780 $60/mo.*	**$600 $24/mo.***
2400 bps	**MODEM 2200/24** Half or full duplex operation over dial or dedicated facilities.	$1780 $60/mo.*	**$725 $29/mo.***
3600 bps	**MODEM 3300/36** Dial or dedicated operation with reverse channel. Optional auto-answer on dial-up.	$3620 $85/mo.*	**$950 $38/mo.***
7200 bps	**MODEM 4800/72** Dedicated line with optional multiport operation for up to three 2400 bps channels.	$6900 $165/mo.*	**$1995 $80/mo.***
9600 bps	**MODEM 5500/96** Dedicated line with optional multiport operation for up to four 2400 bps channels.	$7990 $185/mo.*	**$2995 $120/mo.***

Prices apply to sale or lease in U.S. only. * Based on 30 month lease.

Racal-Milgo Special Offer Division, 8600 N.W. 41st St., Miami, FL 33166
Reserve now. Phone collect (305) 591-5535 or send this form.

Racal-Milgo – the new name for ICC

I want more information about your Special Offer Division products.

☐ Yes, I am interested in the May special. Please send order form and data sheet.
☐ Purchase ☐ Lease Quantity_____
☐ I'm interested in the following:

Product	Quantity

☐ Purchase ☐ Lease

Name and Title
Company
Street
City State Zip
Phone No.

☐ Please place me on your mailing list for future specials. CW 5/1

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

ISI

INDEPENDENT

WE BUY - SELL - INSTALL & REPAIR
AT REASONABLE PRICES

HONEYWELL USED SERIES 200 EQUIPMENT
COMPUTER SYSTEMS
PARTS — PERIPHERALS

Now in stock
2040 64K M7 32K M9
120-1250 TAPE DRIVES
READERS PRINTERS PUNCHES
3200-131K Avail. 6/78

CALL NOW
Wilson Grabill (513) 874-8100

INTEGRITY SYSTEMS, INC
4812 Interstate Drive
Cincinnati, Ohio 45246

PROFESSIONAL DEALER/LESSOR OF IBM COMPUTER SYSTEMS

Bob Russell
Jack Emery
Dave Hepburn
Paul Baillie

SYSTEMS MARKETING, INC.
200 E. Thomas Road
Phoenix, Arizona 85012
(602) 264-5600 Telex 667-334

SMI CDA

BUY-SELL TRADE
For Computer
Call Action Write
CAC
404/458-4425 P.O. Box 80572 Atlanta, Ga. 30366

CONTINENTAL Information Systems

BUY, SELL, LEASE, SUBLEASE, AND TRADE
NEW AND PRE-OWNED IBM EQUIPMENT
AVAILABLE

168 KJ - 8 Channel - May
165 K - DAT available - April
158 J - 2 Megs OEM - May
158 AP - new, ITC qualifying - April
155 J2 - April
145 J2 - April

WE ALSO HAVE NEW, ITC QUALIFYING 168, 158, 148, and 138 IN APRIL - MAY

Call Us!

Peripherals and I/O
All 360/370 Disk, Tape Printers, Readers, and T/P

Gene Chappell
Wanted:
3330's, 3340's & 3420's

CIS
CIS Corp.
600 MONY Plaza
Syracuse, NY 13202
315-425-1900

CIS is very interested in buying pre-owned IBM 370 systems. If you are thinking about selling, let us make you an offer.

MINICOMPUTERS & SYSTEMS
Don't waste company time or money. Check with us before you buy or sell.

New DEC Equipment
Immediate Delivery
RK11-RK05 Disk Systems - $8500
PDP 11/04s and 11/34s - 20% off list
DZ 11
DEC Station 78

New DG Equipment
Immediate Delivery
DG 10 Mbyte Disk Systems from $7500
DASHERS - 15% to 25% off list
Nova 3/12 or 3D - 20% off list

Immediate delivery for MOS!
Inventory Clearance
call us for free brochure

MINICOMPUTER EXCHANGE
(408) 733-4400
TWX 910-339-9272

BROKER IN DEC COMPUTER SYSTEMS AND COMPONENTS
C.D. SMITH
730 N. Post Oak Road
301
Houston, Texas 77024
(713) 686-9405

FOR SALE/LEASE
DEC LSI 11®
PDP 11V03 SYSTEMS
LA 36 DECwriters
LA 180 * VT 52
In Stock For
IMMEDIATE DELIVERY

UNITRONIX CORP.
1081 U.S. Hwy 22
P.O. Box 6515
Bridgewater, N.J. 08807
(201) 725-2560

BUY — SELL — LEASE — BROKERAGE
Let the
"NATIONS LARGEST WHOLESALE DEALER"
Buy, sell, lease, sub-lease, or be your agent in placement of your pre-owned IBM 360/370/System 3, or other units
COMPUTER INTERNATIONAL, LTD.
CWC's international division —
experts in foreign markets, freight, customs
BEACH COMPUTER CORPORATION, CWC's Leasing Division
COMPUTER WHOLESALE CORP., (504) 581-7741
SUITE 507/508 FIRST NATIONAL BANK OF COMMERCE BLDG.
NEW ORLEANS, LOUISIANA 70112
CDA MEMBER OF COMPUTER DEALERS ASSOCIATION

CDA

Know us by our mark

CDA, Computer Dealers Association, is an international nonprofit trade association dedicated to promoting the advantages of used computers. For a membership roster and copy of our code of ethics, write to: **Mr. Marvin Lurie, Executive Director, Computer Dealers Association,** 6650 Northwest Highway, Chicago, Illinois 60631 (312) 763-7350.

FOR SALE OR LEASE 370/**168**
AVAILABLE JUNE '78 (MODEL 1, 3 or A)
Bob VanHellemont
CMI CORPORATION — (313) 642-8000

For Sale Or Lease
System 3/15
Complete Systems
- SHORT OR LONG TERM
- CONFIGURED TO YOUR NEEDS
- WITH OR WITHOUT PERIPHERALS

Any configuration from B19 to D24
30 to 90 days delivery
Also complete inventory tapes — disks.
Printers — CPU Upgrades

CDB FINANCIAL, INC.
3131 MAPLE AVE • 15B DALLAS, TEXAS 75201
214—745-1749

ACR

EDP departments save money working with brokers and dealers linked by the ACR network:
- ☐ national markets,
- ☐ on-line access,
- ☐ better matches of equipment to need.

For your nearest ACR broker/dealer contact:
American Computer Referral
423 South Brookhurst St.
Anahelm, CA 92804
(714) 776-2411

The only on-line computerized data base for computer equipment

---

LEASING?
WE'VE GOT YOUR 303X ON ORDER
...plus 135, 138, 145, 148, 158 & 168's too
(over $130 million worth!)

- We'll write a short-term or long-term lease — on YOUR system or OURS
- We'll configure a total system or part of one to your specifications

"Our leasing concepts are sensitive to your needs"

COMPUTER CAPITAL CORPORATION
1351 WASHINGTON BLVD., STAMFORD CT., 06902
203-357-9663

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

IPS 201-947-4200

FOR SALE OR LEASE

165K-II
4 megabytes with DAT and channels.

158K
With ISC available on 2 year lease

155J-II
up to 2 megabytes with DAT.

145
Model 2 CPU, any core size w/ or w/o ISC

135-I
Will sell or lease as an H. Has full feature complement.

148/138
Several of these machines are now available from the original users. They work like new but cost significantly less. Give us a call!

65-I
up to 2 megabytes and/or 6 channels.

50-I
Also have a 50-H. Both have 3 channels.

3420-X
Most models readily available with controllers.

WANTED TO BUY

168, 158, 148, & 138's
165, 155, 145, & 135's.
All 370 peripherals, CRT's & controllers.

IPS Computer Marketing Corp., 2460 Lemoine Avenue, Fort Lee, N.J. 07024

FOR SALE

3275-2 Display Stations
3286-3 Printers
3284-3 Printers
50-70 Available Now-November
3350 B2F Disk Storage
3 Available June 1
Call or Write

(714) 833-9800
TWX 910-595-2550

SADDLEBACK MARKETING CORP.

1401 Dove Street, Suite 245
Newport Beach, CA 92660

GRAPHIC RESOURCES CORPORATION

The Graphics Specialists

Plotters-Sale, Purchase, Leasing
Plotter Supplies-Manufacturer
Plotter Re-Conditioning
Services & Parts
Interactive Graphic Systems
Line Printers
All Manufacturer's Equipment Available

GRAPHIC RESOURCES CORP.
Offices Located In:
Los Angeles, Houston
Denver, Washington, D.C.
CORPORATE OFFICE:
(213) 598-3318 (714) 898-3584
5442 Research Drive
Huntington Beach, Calif. 92649
CALL OR WRITE FOR FREE BROCHURES & SAMPLE PLOTTER MATERIAL SWATCH

For Sale
Digital Scientific

META 4/1130

28K Words of Memory
2 75ips Wangco Tape Drives
1000 Documation Card Reader
600 lpm Data Printer
3 660 Memorex Disk Drives
SAC
MTCA

Contact
Joanna Hwang

EDM
Computer Services

2670 Union Extended, St. 228
Memphis, TN 38112
(901) 324-6121

---

dataserv

370 CPUs System Memory
115-138
Steve Lacny

370 Ron Olson
145-148 / 155-158
370 Jim Meyers

360 **Memory**
M. J. Dorsey

CPUs Peripherals
360
Neal Johnson

Returning Equipment to IBM?

Before you send any of the following machines back to IBM, call us. We'll show you how to make money using your rental credits.

CPUs	Disk	Tape	110
3115	3330	3410	1442
3125	3340	3411	2501
3138	3344	3420	2821
3148	3350	3803	3505
5415	3830		3525

CPUs Peripherals Memory
Sys/3
Models 6-15

System
32-34
Mary Cronan

Tape Disk I/O
370 **Peripherals**
Tom Anderson

3741-42
Becky Ernst

Call Toll Free 800-328-2406
or 612-544-0335
Or write: Dataserv Equipment, Inc., 9901 Wayzata Blvd.
P.O. Box 9488, Minneapolis MN 55440

buy • sell • lease • trade

DEC
PROCESSORS
PERIPHERALS & MODULES

BUY - SELL - LEASE - RENT

$2,000,000
NEW & USED DEC INVENTORY

PROCESSORS:

11/04	11/40
11/05	11/45
11/34	11/60
11/35	PDP-8E

DISKS:

RK05F	RP03
RK05J	RP04
RK11D	RX11BA
RP02	S.I. 3010

TAPE DRIVES:

TJU16	WANGCO 1037
TMB11	W/PDP-8 Interface

MEMORY:

MJ11BE	MM11UP
MM11DP	MM11WP
MM11L	MS11FP
MM11LP	MS11JP
MM11U	

MISCELLANEOUS:

DH11AD	KE11E
DL11A, B, C, D, E	KE11F
DL11W	KT11C
DR11B	KT11D
DR11C	M7259
DR11K	M7260
DU11DA	M873-YB
DZ11A	M920
DZ11E	M930
FP11C	M9301-YA

OTHER:

BEEHIVE SUPERBEE
HP-2114
LEAR SIEGLER ADM-1
PENRIL 1800 BPS

For fast delivery and substantial $aving$
CALL the DATALEASE Digital HOTLINE

800-854-0359

DATALEASE

700 No. Valley St., Ste. A, Anaheim, California 92801
(714) 533-3920 Telex 692439

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

370's

Heavy Type		Features
168	KJ	1435, 4524
	3066-2	4525
	3067-2	1435, 4525
	2870-2	
	3880-2	
125	G	4501, 4662, 4667, 4668, 4675, 4680, 4685, 143, 3509, 3525
135	GF	4640, 4655, 4668, 6981, 6982,
	3046	7855, 7860, 4724
	3215	
135	GF	4640, 4322, 4723, 4724, 6981,
	3046	7855, 7860, 7862
	3215	

FOR IMMEDIATE LEASE

CALL: BOB SHANEY
(313) 337-6830

WRITE:
FORD MOTOR CREDIT COMPANY
P.O. BOX 1729
DEARBORN, MICHIGAN 48121

Ford

168 AP

AVAILABLE AUGUST 1978

3033

AVAILABLE DECEMBER 1978

Dan Young

Federal Data Corporation

301-652-5766

When you plan to buy or sell your computer equipment...

For complete information call the Greyhound Representative in your area.

WANT TO BUY

370/158 370/155 370/145

U S	Home Office	T. A. Takash	602-248-6037
	New York	Dick Ventola	914-949-1515
	Chicago	Pete Ahern	312-298-3910
	Dallas	M. W. "Bill" Tucker	214-233-1818
	San Francisco	Henry Paulson	415-283-8980
INTERNATIONAL	Canada	Don Maunder	416-366-1513
	U.K./Europe	Joe Gold	022-61-27-54
	Mexico	Andres' Contreras	905-543-6850
	Austro-Asia	John Hallmark	214-233-1818
	Eurasia	Don Haworth	214-233-1818
NON IBM	Dallas	John Hallmark	214-233-1818

GO GREYHOUND
Greyhound Computer Corporation
Greyhound Tower, Phoenix, Arizona 85077

PIONEERS IN THE USED COMPUTER INDUSTRY

360, 370 Data Entry Teleprocessing

DATA AUTOMATION COMPANY INC.

Systems 3, 32 All Peripherals

4858 CASH ROAD · DALLAS, TEXAS 75247 · AC 214 · 637-6570

MAJOR DEALER IN USED COMPUTERS

ALL SYSTEMS & PERIPHERALS

IF YOU ARE RETURNING RENTAL CREDIT EQUIPMENT TO IBM WE CAN SAVE YOU FREIGHT AND MAKE YOU MONEY!

The Professionals

Member Computer Dealers Association

LEASE/PURCHASE UNIVAC 90/30
COMPATIBLE ADD-ON MEMORY
WITH MAINTENANCE PROGRAM
UNIVAC/RCA

CPU'S
9200, 9300, 9400, 90/30, 90/60, 1106, 1108, 1100/10, 1100/42 (all core sizes).

I/O SETS
Card Readers, Card Punches

PRINTERS
0768-00 & 99, 0770-02, 0773-99

TAPE DRIVES
U-6C, 10C, 12C, 16C, (Controllers)

DISC DRIVES
8411, 8414, 8416, 8418, 8425, 8430 (Controllers)

MEMORY UPGRADE
All CPU's

RJE
1004/w/DLT or 9200/9300 w/DCS-1 or 4 Uniscope 100's, Keypunches, 1710-4 CADE System.

For details, call R. Weissblatt - 216/351-7444

HONEYWELL

Ask about our complete services including maintenance 64/20 Complete Sys Avail. Now.

MEMORY
M3-32K; 64K; M6; M7's; M9's thru 196K

TAPES
204B's, 4's, 8's, 9's, D3's, F3's

PROCESSORS
ANY MEMORY SIZES H200, 1250, 2200, 3200, 4200, 3040A, 66/20

DISCS
259's 273's 275's 277 1x4

COMMUNICATION
281-2B, 281-2R, 286-4, 775-2

PERIPHERAL
223's, 214's 222's, 220-3, 213-3

For details, call Larry Donat-216/351-7444

The Computer Place.
4650 Spring Roc

4650 Spring Road
Brooklyn Heights, Ohio 44131
(216) 351-7444

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

BEFORE YOU BUY, SELL, OR LEASE, TAKE A 'SECOND' LOOK!

FOR SALE

3135-H with 4655, 6981, 7861, 3215
Delivery 8/78
3145-HO with 512K Add-On CMI Memory
Delivery 5/78
3155-J with DAT Box—Delivery 7/78
3158-K—Delivery 6/78
3158-K—Delivery 8/78
3158-U34—Delivery 8/78
3031 Lease—Delivery 10/78

WANT TO BUY

3145-J2—Inst. 7/78
1442-N2
2821-1
3830-2
2880-2

TW COMPUTER INDUSTRIES INC.
3570 American Drive • Atlanta, Georgia 30366
404/451-1895 • TWX 810/757-3654
CHICAGO — 312/298-5650
WASHINGTON — 703/525-3074
LOS ANGELES — 213/370-4844

FOR SALE

One MARK III
DATA DEVICES
TAPE CLEANER
Excellent condition $800.00
CONTACT:
Mr. B.A. DeCicco
Evans & Co., Inc.
Evans & Co., Inc.
110 Wall Street
New York, N.Y. 10005
(212) 344-7700

BUYING, SELLING, LEASING OR TRADING IBM EQUIPMENT? THEN CALL US FIRST...

CSI COMPUTER SALES INTERNATIONAL, INC.
901 Office Park Plaza Oklahoma City, Ok 73105 405-840-1911
Houston, Tex 713-444-0246 | St. Louis, Mo 314-727-7010

BUY • SELL • LEASE • TRADE

SYSTEM/3 370/115 370/125

ECONOCOM
ECONOCOM
1255 LYNNFIELD ROAD
P. O. BOX 17825
MEMPHIS, TENNESSEE 38117
901-767-9130
MEMBER COMPUTER DEALERS ASSOCIATION

INFORMATION DISPLAY SYSTEM

COMPUTER OPTICS (direct replacement for IBM 3270) includes:
CO: 8271 Minicluster Controller
(1) with BPS Sequenser
CO: 9277-2-1920
Character Display (6)
CO: 8631 - EBCDIC De
Keyboard - 66 keys (6)
CO: 7780-1 EBCDIC
Printer - 275 CPS (2)
Equipment is one year old. Available within 60 days. $18,000.
Contact: Computrex, Inc.
814 Thayer Avenue
Silver Spring, MD 20910
(301) 565-0288

BUYING

N.C.R. 270-299-399-775
31, 32, 41, ETC.
BURROUGHS "L" SERIES,
B700, B1700
I.B.M. 129-029-Systems 32/34

SELLING

129's-029's-059's
immediate delivery
Also: 026-056-082-083-084
085-088-402-403-407-514
519-548-552-557
Eligible For IBM M/A

WILLIAM MARION COMPANY, INC.
P.O. BOX 309/HACKENSACK, N.J. 07602
FOR MORE INFORMATION CALL (201) 343-4554

BUY SELL LEASE

370, 360, 1401 & 1440 SYSTEMS & PERIPHERALS
PURCHASE/LEASEBACK
029, 129, 3741, 3742, 3540, 3803, 3420, 3340's
IBM UNIT RECORD EQUIPMENT
026, 082, 083, 084, 085, 087, 088, 402, 407, 514, 519, 548, 552, 557,
029-059-129

Call us for all your needs; we buy rent and sell all types of IBM unit record equipment. Over 12 years of serving commercial and government requirements. Contact ACS for proposal.

ACS 7126 Mullins Houston TX 77081 (713) 666-2122 TWX 910-881-1526
EQUIPMENT CORP.

Certification Specialists

Disk Packs Data Modules

Bought - Sold - Traded
tested refurbished
Contact
Rick Hubata, Sales Director
Systems Supply Corp.
833 W. Jackson Blvd.
Chicago, IL 60607
(312) 421-2900

FOR SALE

NCR-399
Mini-Computer/
Accounting Machine
2 cassette handler
12 K memory
Magnetic ledger
cards
Continuous forms feeder
CALL
212-431-6685

WANT TO BUY

IBM 370-135H (262K) with 3046-1 and 3215-1. Require May delivery Principal & Users Only
CW Box 1552
797 Washington St.
Newton, MA 02160

For Lease

3420-3's	July 15
3420-6's	June 1
3271 & CRT's	Now
3031	11/78.

For Sale

2065	June 15
6780 Blk Mpx	June 15
1x6 Cal Comp	As July 1
345	

Computer Concepts, Inc.
6443 S.W. Beaverton Highway
Portland, Oregon 97221
503-297-4721

PDP - 11/70

Model D572-C-AA
2 RP05 88MB drive & cont.
1 DH11-AD 16 Line MUX
2 9 track - 800 CPI tape & cont.
3 VT52 AE CRT Terminals
1 300 LPM Printer
DATA PROCESSING
SERVICES OF FINDLAY
Hancock Savings &
Loan Building
Findlay, Ohio 45840

CENTRON

Computer Corporation
The THINKing person's alternative . . .
BUY • SELL • LEASE
IBM Computer Equipment
360/370/30XX and Peripherals
Call us for current availability and pricing
612/884-3366
8120 Penn Avenue South • Minneapolis, Minnesota 55431

FOR LEASE

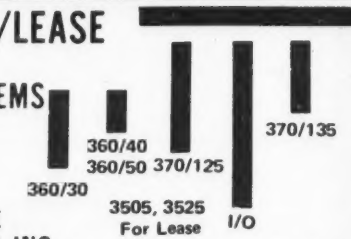
IBM 370/148-K with ISC
(1) 3830-2, (2) 3803-1
(12) 3420-5, (9) Memorex 3340 equiv.
Will lease for 3 years
Available - Early July
Contact: Mr. Frederick D. Lehmann
Martin Marietta Data Systems
P.O. Box 5837, MP-263
Orlando, Florida 32855
(305) 855-1050, Ext. 7410

WANT TO BUY

CMI MEMORY
Model 30,40,50,65, 155
Call
Ken Gilmore
(213) 777-4070

PURCHASE/SALE/LEASE

ALL 360 & 370 SYSTEMS



CORPORATE COMPUTERS, INC
115 Mason St., Greenwich, Conn. 06830 (203) 661-1500
Member Computer Dealers Association

Available Now

3135-I

Two or three year lease
- All IBM Memory
- Most features, including IFA
- 3046 & 3215

Call: Mike Seekings 800-243-5308

RANDOLPH COMPUTER COMPANY

537 Steamboat Rd. Greenwich, CT 06830

FOR SALE:
COMPLETE BURROUGHS B730 SYSTEM
- Contractors software including P/R, A/P, G/L equipment and job cost reporting
- Disk cartridges, cassettes, and other supplies
- Low monthly payments available
- Perfect for growing companies or small service bureaus
- Available May 1, 1978

Contact:
Getting Industries, Inc.
RR Box 10
Hurley, SD 57036
Ph. (605) 238-5201
TWX 910-660-0563

WANTED TO BUY

2040 G or H 128K Indep.
High Speed I/O w/UCS
2401-3 9 Track
129-1 Keypunch

Kennsco
7232 BOONE AVE. NO. / MINNEAPOLIS, MN 55428
PHONE 612/533-5800

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

Buying, Selling, Leasing Purchase & Leaseback

3277 3803 3286
3272 3420 3284
3340 3330 3830

Call us on IBM Rental Credits. We buy your credits on FTP, ETP and MAC equipment.

R.K. ENTERPRISES, INC.
470 Main Street, Ridgefield, Connecticut 06877
Contact: Bob Haggerty 203-438-9567
Charles Pratt 214-361-8337

Marketing Centers: New York, Dallas, Atlanta, Cincinnati, Los Angeles

FOR LEASE
3033-U8

Early Oct. '78
Principal to Principal

CW Box 1555
797 Washington St.
Newton, Mass. 02160

FOR SALE

IBM System/32
$28,000
32K CPU
9.1 M Bytes Disk
155 LPM Printer
Available August
Call Irv DeRoeck
Bay de Noc
Community College
Escanaba, MI
(906) 786-5802

NATIONAL COMPUTER RENTAL
415 MADISON AVENUE
NEW YORK, NEW YORK 10017
(212) 532-1500

MEMBER OF TIGER LEASING GROUP

SHORT AND LONG TERM STRAIGHT WALK-AWAY LEASES
THAT'S RIGHT!

National does not require our customers to guarantee any residual value or find qualified sub leases at the end of the initial term on the equipment.

370/138, 148, 135, 145, 125
370/158's 168's
IBM Series-3031-3032-3033

MEMBER OF COMPUTER LESSOR ASSOC.

efm computer leasing, inc.

3000 marcus avenue
lake success, ny 11040
(516) 488-7876

LEASE • BUY • SELL

360/370 CPUs & PERIF.

ATTRACTIVE LEASES ON

360/40 360/65
360/50 370/135
370/145

15 KEYTAPES

Tremendous savings on 15 NCR 735-101 Keytape terminals with IBM keyboard plus 1 NCR 7 to 9 Tract Converter. Must sell immediately - Best offer will be accepted. Spring Hill Nurseries, Tipp City, Ohio.

(513) 667-2491

BUY **Surplus DEC And Data General Hardware** SELL

For Sale

PHIL THOMAS (305) 272-8753

Thomas Business Systems, Inc.

303X Leasing

Large industrial corporation wishes to purchase and lease back to substantial corporations IBM 303X Systems. We will only deal with end users and equipment must be scheduled for delivery in 1978.

CW Box 1410
797 Washington St.
Newton, Mass. 02160

LIQUID COOLED MAIN FRAME USERS

We have a cooling unit for liquid cooled CPU's that operates up to 50% cheaper than other available units. Saves installation time and money. Does not take up space in computer room. Comes complete with 100% back-up system.

CONTROLLED ENVIRONMENT CORP.

640 Reynolds
Kansas City, KS 66101
(913) 342-3599

Over ten years experience in computer room environments. Ask about a heat recovery system for your EDP site. Could save you a small fortune in utilities.

FOR SALE OR SUB-LEASE

IMMEDIATE DELIVERY

CMC-6 DATA ENTRY EQUIPMENT

200,000 Record Disk
16 Key Stations

THOMAS NATIONAL, INC.
117 Broadway
New York, N.Y. 10019
(212) 765-8500

FOR SALE
IBM 360/40 CPU

1052
256 K
TIMER

Storge Protect
Single Selector Channel
Floating Point Arithmetic

Contact:
Purchasing Department
(309) 694-5438

Illinois Central College
East Peoria, IL 61635

WANTED

ALL 360/370 SYSTEMS AND SYSTEM/3
AND PERIPHERALS
WE BUY • SELL • LEASE • TRADE

transdata

P.O. Box 47762 Dallas, Texas 75247 PHONE (214) 631-5647

IBM UNIT RECORD EQUIPMENT

MACH	SALE	LEASE	MACH	SALE	LEASE	MACH	SALE	LEASE
024	$ 200	$20/Mo	059	$1400	$50/Mo	129	$3400	$110/MO
026	$ 800	$30/Mo	082	$ 800	$30/Mo	514	$ 800	$ 45/Mo
029	$1800	$55/Mo	083	$1700	$60/Mo	519	$1000	$ 55/Mo
046	$ 900	$40/Mo	084	$2500	$90/Mo	526	$1200	$ 50/Mo
047	$1400	$60/Mo	085	$1200	$60/Mo	548	$1500	$ 60/Mo
056	$ 200	$15/Mo	088	$2500	$150/Mo	557	$2900	$100/Mo

Sale: 360/20 system: $9500. WANTED TO BUY: IBM rental Credit 029-- and --129.

THOMAS COMPUTER CORPORATION

600 N. McClurg Court - Suite 4202
Chicago, Illinois 60611
(312) 944-1401

Calif. Branch
115 Harbor Island Rd.
Newport Beach, CA 92660
(714) 675-2810

THREE AND FOUR YEAR WALK-AWAY LEASES

1. ATTACHED PROCESSOR FOR 3158

2. 3158 - 3 MEG WITH APU FEATURE
SPRING AVAILABILITY

3. 3158 - 3 MEG MOD 3
SUMMER AVAILABILITY

TNC

THOMAS NATIONWIDE COMPUTER CORPORATION

Brian M. Battle – (312) 944-1401
600 North McClurg Court-Suite 4202A
Chicago, Illinois 60611

Paul Nortman – (516) 752-1000
1 Huntington Quadrangle-Suite 4S13
Hungtington Station, New York 11746

FOR SALE OR LEASE

2065 (4) 2365-2, 2860-3, 2870-1, 6990, 6991, 1052-7

AVAILABLE
7-1-78

Contact:
Jack Emery/
Dave Hepburn

SMI SYSTEMS MARKETING, INC.
200 E. Thomas Road
Phoenix, Arizona 85012
(602) 264-5500 Telex 667-334

IBM 360-50
AVAILABLE FOR SHARING

(WALL ST. AREA)

3 SEL. CH.
12 2314
8 2401-3
3 1403-N1
2 2501
1 2540-RP

CONTACT: FRANK SAHANAS
(212) 344-2300 X 275

buy sell swap | software for sale | software for sale | software for sale | software for sale

PC 920 96 Column

Data Recorder For Sale
$3800.00
(208) 529-1242
or Glen Moss
P.O. Box 220
Idaho Falls, Idaho 83401

COMPUTER FLOORING

FOR SALE

3,000 Sq. Ft. Westinghouse; 2,500 Sq. Ft. Severn; All Perma-Klean Tile

USED COMPUTER FLOORS, INC.

(713) 789-4610
9554 Fairdale Lane
Houston, TX. 77063

For Sale

Tektronix

2-Model 4051 Graphic Terminals 32K, Data Comm 1/F Binary Program Leader ROM
1-Model 4662 Digital Plotter

Call Steve

CMT Corp.

(201) 440-4800

INTERACTIVE PDP-11 APPLICATIONS

Applications Software	Timesharing Dataservices
• Accounts Receivable	• Dual PDP-11/70's
• Accounts Payable	• National Network
• General Ledger	
• Payroll/Personnel	• RSTS/E System Utilities
• Order Processing	• Distributed Datasystems
• Inventory Control	• Word Processing Systems
• Financial Planning	• Software Development

The RSTS/E Applications Specialists

ims Interactive Management Systems, Inc.
375 Concord Avenue
Belmont, Mass. 02178 (617) 489-3550

WANTED G/L SOFTWARE

Large, consulting company wishes to acquire license to a general ledger and financial reporting package. License would include full marketing rights. Please include summary description of package and owner in reply to

CW BOX 1554
797 Washington St.
Newton, MA 02160

GENERAL LEDGER $400 FULL PRICE

*Check Register *Journal Register
*General Ledger *Trial Balance
*Balance Sheet *Income Statement

Complete bookkeeping system for any medium to small company. Over 500 customers processed during the last ten years. Modular parameter design can be adapted to any small computer. Written in low level IBM Cobol. Price of $400.00 includes Source programs, sample JCL with test data, and complete operating procedures.

FREE SAMPLES & DOCUMENTATION

GENE SUMRALL
4211 S.W. Freeway
Suite 106
Houston, Texas 77027

BAYSYS

SOFTWARE LIBRARY & DEVELOPMENT SYSTEM

- Effective software management
- Powerful programming aide
- Exclusive combination of features
- Free trial period
- IBM 360/370

from $1995.00

Glosser Software Associates
625 Locust St. Sausalito, CA 94965
(415) 332-1463

FOR SALE NEW/USED

H-P 3000

264X TERMINALS
7920S DISKS
APPLICATION SOFTWARE

Immediate delivery on some items
Peter Melvin
(617) 266-4933
CMC Associates
755 Boylston St.
Boston, MA 02116

SPECIAL TRIAL OFFER! TEXT PROCESSING FOR DEC-10'S AND -20'S

Evaluate **ADMS-II** at your site for **30-90 days.** ADAPT's new **ADMS-II** software is the most powerful text composing, formatting package ever developed for document preparation. Special hardware is not required. A multitude of documents including manuals, catalogs, directories, reports, contracts and brochures can be created from a regular computer terminal. Final output can even be to a photo-typesetter.

ADAPT's special evaluation opportunity includes **installation, 3 days of training** by ADAPT personnel, **user manuals** and **an output driver** written for a proofing device. The fee for the 30 day period is **$1,000** which can be applied to the purchase price.

TRY ADMS-II FOR YOUR DOCUMENT PREPARATION

ADAPT, INC.
450 Sansome Street
San Francisco, CA 94111
(415) 989-0180

FOR SALE OR LEASE

IBM 360/30's-32, 64 Immediately or 128K
IBM 2314-A1 1x4 (lease only) 4/24/78
IBM 3271-2 Controllers 30 Days
IBM 3277-2 Terminals 30 Days

Call Collect or Write

Berlent industries, Inc.

1975 Hempstead Turnpike
East Meadow, N.Y. 11554
(516) 794-9722

Member Computer Dealers Association

For Sale or Lease

IBM 3741-3 Data Station (3)
3715-1 Printer (3)
3747 Data Converter

Univac 9300 32K
Burroughs 3500
Burroughs 1700

Norton Computer Corp.
10405 Town and Country Way
Suite 301
Houston, TX. 77024
(713) 932-6564

TONE 3

IS HIGH PERFORMANCE-LOW OVERHEAD

TSO for VS1

CHECK THESE FEATURES

- Edit with full screen capability
- Internal reader job submit
- Output retrieval with RES support
- System maintenance
- Program development
- Data entry
- System debugging
- Text editing
- Performance monitoring support
- User command interface
- Interactive program execution
- Operations console support
- Dataset maintenance
- Catalog management
- Standard IBM TSO commands
- Enhanced 3270 useability
- Full ASCII terminal support
- No user swapping
- No TCAM
- No VS/2 overhead

TONE SoftwareCorp. *Write for Details* 11588 TRASK AVE. GARDEN GROVE, CA 92643 (714) 636-8501

GENERAL LEDGER SYSTEM?

What was the only one on the 1977 Datapro Honor Roll?

The answer is: The UCC General Ledger/Financial Control System. It can solve the Accounting Department's financial information problems...without creating new ones for EDP. Call 1(800) 527-3250 toll-free (in Texas, call 214/688-7313) for more information.

UCC
UNIVERSITY COMPUTING COMPANY
P. O. Box 47911 • Dallas, Texas 75247

1977 datapro HONOR ROLL

SOFTWARE

RPG II SYSTEMS

*A/R-OPEN ITEM OR B/F
*ACCOUNTS PAYABLE
*GENERAL LEDGER
*PAYROLL AND LABOR DIST.
*INVENTORY
*CREDIT UNION' MAILING, ETC

Extensive Documentation Provided

Bancroft Computer Systems
P.O. Box 1533, Dept. C
West Monroe, LA. 71291
(318) 388-2236

PROVEN Packages from Professionals

LARGE COMPUTER SYSTEMS — for users of IBM, BURROUGHS, DEC, HONEYWELL, UNIVAC and ICL computers.

Financial
- General Ledger and Financial Reporting
- Accounts Payable
- Accounts Receivable
- Fixed Asset Accounting

Manufacturing
- Material Requirements Planning
- Master Production Scheduling
- Capacity Planning
- Shop Floor Control
- Purchasing

Comprehensive Report Generator
- FILETAB

SMALL COMPUTER SYSTEMS — for users of System/3 and other IBM, Burroughs, Univac 9030, Honeywell 62, HP 3000, DEC, Interdata and most popular business minicomputers.
- General Ledger and Financial Reporting
- Accounts Payable
- Accounts Receivable
- Fixed Asset Accounting

Get all the details. Today.

Name
Title
Company
Address
City
State Zip
Phone Computer

SOFTWARE INTERNATIONAL®
Elm Square Andover, Mass. 01810 (617) 475-5040
Atlanta • New York • Washington, D.C. • Philadelphia • Chicago
San Diego • Toronto • Houston • Columbus, OH • San Francisco
CW-518

converting?

TRY THE EXPERTS

DASD Corporation encourages test evaluations of all of our language translators.

If your going from: To:

RPG/RPG II	ANS COBOL (DOS on OS)
SYSTEM 3 COBOL	ANS COBOL-OS
DOS COBOL	ANS COBOL-OS
GE MAP	ANS COBOL-OS
360/20 BAL	360/370 ALC

. . . DASD has an immediate solution to your conversion problems. Other source/target languages? — Let's talk about it! We encourage test evaluations on all products.

Call or write today

DASD CORPORATION

DASD Corporation
National Marketing
1480 Renaissance Drive, Suite 315
Park Ridge, Illinois 60068
312/299-5005

software for sale		time & services	time & services	time & services

ACCOUNTS PAYABLE

Now a low-cost software package for mini or mainframe computers with many cost-saving features:

- Batch processing using single data base for fast processing
- Modularly structured COBOL programs reduces maint. costs
- Multi-company facility avoids duplicate software.
- Flexible retrieval facility for printing reports & more.

For full details on how our APS software can save you time and money, call (415) 254-1264, write:

LEGLER SYSTEMS CO.
23 Charles Hill Rd.
Orinda, CA 94563

MEDICAL/DENTAL BILLING

Complete Billing and Insurance Processing for doctors, groups and clinics.

- Complete Insurance Forms
- Profile, RVS, ICDA Files
- Bal. Forward, Ledger
- COBOL or RPG II
- 30+ users
- 360/370 or mini-computers
- On line, Real-Time or Batch Processing

Occidental Computer Systems
10202 Riverside Drive
No. Hollywood, Calif. 91602
(213) 763-5144

HP 264X

SCREEN FORMATTING MADE EASY

COMPLETE SOFTWARE & METHOD FOR
• Layout • Documentation
• Generation • Editing

COMPUTER SYSTEMS CONSULTANTS
825 W. TIPTON • • (602) 624-3106
TUCSON, AZ. 85705

MICRO

APL SOFTWARE, APPLICATION PACKAGES, custom programming, and computers are available now! We buy, sell, lease and support IBM 5100's and 5110's. Gary Tremblay Alta Consultants Box 848 Huntington Beach, California 92647. (714) 847-3755.

BUSINESS SOFTWARE Fast running FORTRAN Professional Software using ISAM for 80/80. GENERAL LEDGER: 200 accounts, 9 levels of totals, percentages on I/E, run-time selection of level of detail, forces balanced entries of transactions, verifies accounts are valid, puts I/E totals in Balance Sheet, automatic backup of files, and more. PAYROLL: prints checks, multi-state taxes, 3 types local taxes, multi-pay periods, untaxed pay, salaried/hourly employees, W2's, 941's, check register, department reporting, manual checks allowed, tax tables user changeable, auto backup of files and more. Accounts Receivable, Payables under development. Customization, Systems Development available. G/L, P/R $775 ea.; A/R, A/P $495 ea.; all $2250. Manuals $15 ea. applyable. Engram Associates, 11601 Rodney Parham, L.R. Ark., 72212 (501) 227-8885.

TIME & SERVICES

370/158 MVS 4 MEG

WYLBUR
IMS 1.1.4 DB/DC
7 Days/24 Hours
High/Low Speed Terminals
RJE and Batch
2- Xerox 1200 Printing Systems
Full Key Entry Service

THOMAS NATIONAL
1775 Broadway, NYC
212-765-8500

COMPUTER TIME

Timeshare-Dial Up
Batch Prime 400's

- Excellent Rates
- Convenient Northern N.J./NYC Location
- Complete systems and software support
- Fortran-Cobol-Basic
- Prime time and off hours
- Complete data security including safe storage
- Consulting services available

For Information Call:
Carl Dula
(201) 335-7800

RSA R SHRIVER ASSOCIATES
120 Littleton Road
Parsippany, New Jersey 07054

COMPUTER TIME

RJE - Standalone - Batch
FULLY CONFIGURED
370/158 & 155II
360/30

- COM-OMR FACILITIES
- EXCELLENT RATES
- CONVENIENT CENTRAL JERSEY LOCATION

Call Collect
Larry Muth (201) 524-2083

ICOTECH
P.O. Box 67
Route 202
Raritan, N.J. 08869

REMOTE JOB ENTRY

PHOENIX-HECHT

- IBM 370/158-3
- Nationwide incoming Watslines
- Complete systems and software support
- Full application Library (including all accounting applications)
- All high-level languages
- Prime time and off hours
- VS 2, HASP, INTERCOMM, ROSCOE
- Complete data security including off-site storage

For information
call John MacDougall
at (312) 861-7100

PHOENIX-HECHT
233 N. Michigan Avenue
Chicago, Illinois 60601

Computer Time

available at our

Manhattan Data Center

(ALL SHIFTS)

2-370/155s
with high speed peripherals

DOS/OS support

Full mass media support packages for dupe-elimination, label and computer letter printing

Complete dual system backup

Convenient location and attractive low rates

For further information please contact:

PaineWebber
25 Broad Street, New York, NY 10004
Call: James Crehan at (212) 437-2249 or (212) 437-2225

ACCOUNTING SOFTWARE FOR DEC RSTS/E OR CTS-500 USERS

From one of the pioneers in commercial data processing using RSTS. Completely on-line, interactive systems available for **ACCOUNTS-PAYABLE, GENERAL-LEDGER, FINANCIAL-REPORTING, ACCOUNTS-RECEIVABLE and PAYROLL applications.**

These are consolidating packages and support multi-division company and multi-company corporate accounting functions.

If you are installing or have installed a Digital Equipment Corporation RSTS/E or CTS-500 system, contact us for cost-effective solutions to your core accounting problems.

Plycom services, Inc.

(219) 935-5121
P.O. Box 160
Plymouth, IN 46563

COMPUTER TIME FOR SALE

360/30 256K, (5) 2314'S, 1403N1, 2540, (2) 2400'S. All Shifts Available, Convenient Long Island Location, Call (516) 567-1000, Ext. 276 For Further Information.

I.B.M. 360-40

196K, 6-2401 MOD 5, 8-2314, 1-1403-N1
1-2540, 1401 Compatibility

The American Plan Corp.
100 Crossways Park W.
Woodbury, NY 11797
Contact: John Reeves
(516) 364-2700

Computer Time Brokers & Specialists

- On-site or remote processing
- Serving the Tri-State Area

BROOKE COMPUTER CORP.
250 W. 57 ST., NEW YORK, NY 10019
212/586-0923

WE ARE
BROKERS OF COMPUTER TIME

New York & New Jersey Only
Computer Reserves, Inc.
(212) 687-1840
(201) 676-1881

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Microcomputer Classified Exchange, Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $55.30 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $110.60 per insertion. Extra space is available in half-inch increments and costs $27.65. Box numbers are $3.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us), WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired:_____columns wide by_____inches deep.___

Issue Date(s):_____

Section:_____

Signature_____

Name:_____

Company:_____ Title:_____

Address:_____

Telephone:_____

Send this form to:
CLASSIFIED ADVERTISING
COMPUTERWORLD, 797 Washington St., Newton, Mass. 02160

ACCOUNTS PAYABLE DEC RSTS/E

Is it possible to design, code, checkout and install a RSTS/E Accounts Payable System in 10 man-days?

Probably not!

It may take 10 or even 20 times longer . . . . . .

For less than the amount generally associated with 10 man-days of effort, you can purchase an Accounts Payable System from JEDARK.

$2,995.00

End-user License includes BASIC-PLUS source code and documentation.

JEDARK Corporation
P.O. Box 143
Haworth, N.J. 07641
(201) 387-7388

370/158 mod 3 Datacenter

3.5 meg MVS
Specializing in
Remote Job Entry
TSO, CICS, and Batch
IBM 3800 Laser Printer
Very Attractive Rates
Contact: Stu Kerievsky
(212) 564-3030

Datamor
132 West 31 St.
New York, N.Y. 10001

CORE MEMORY REPAIR

Ampex, Burroughs, CAI, CMI, Data Craft, Data General, CDC, DEC, EMM, Fabri Tek, Honeywell, GAI, HP, Interdata, Lockheed, Plessey, NCR, SMI, Univac, Microdata, Varian, XDS.

Any Manufacturer's Memory

THREE DELTA CORP
1038 Kiel Ct.
Sunnyvale, CA 94086
(408) 734-2680

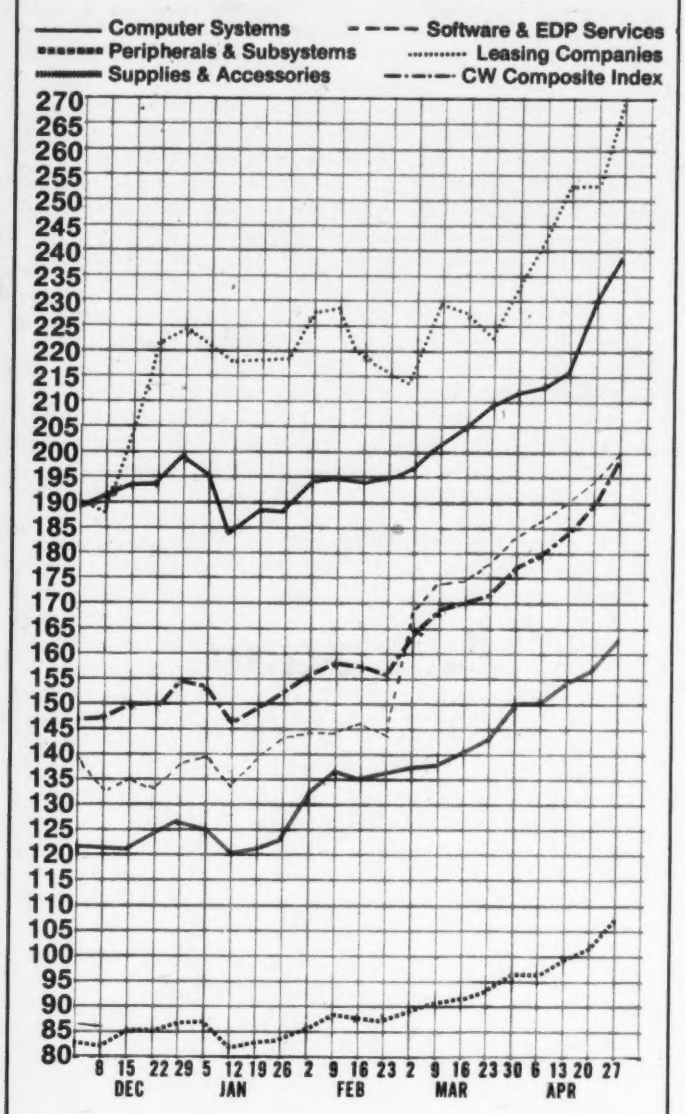
RSTS/E

Consulting/Contract Programming

BASIC PLUS BASIC PLUS 2 RMS
FORTRAN MACRO

Business/Scientific Applications
Performance Evaluation, Systems Software Maintenance + Development

RAINBOW COMPUTING, INC.
10723 White Oak Ave.
Granada Hills, CA 91344
(213) 360-2171



Earnings Reports

CONTROL DATA
Three Months Ended March 31

	1978	a1977
Shr Ernd	$.90	$.75
Revenue	400,3935,000	338,259,000
Tax Cred	300,000	300,000
Earnings	15,681,000	12,981,000

a-Restated.

DATA GENERAL
Three Months Ended March 11

	1978	1977
Shr Ernd	$.85	$.63
Revenue	81,624,000	55,569,000
Earnings	8,464,000	6,218,000
6 Mo Shr	1.67	1.21
Revenue	156,883,000	106,636,000
Earnings	16,632,000	11,931,000

DOCUMATION
Year Ended Feb. 3

	1978	1977
Shr Ernd	$1.22	$.73
Revenue	31,555,000	18,582,000
Earnings	3,657,000	2,021,000

HAZELTINE
Three Months Ended Dec. 31

	1978	1977
Shr Ernd	$.40	$.37
Revenue	17,555,000	15,067,000
Earnings	808,000	750,000

IBM
Three Months Ended March 31

	1978 (000)	1977 (000)
Shr Ernd	$4.01	$3.82
Revenue	4,431,878	4,090,295
Earnings	589,016	573,343

NATIONAL COMPUTER SYSTEMS
Year Ended Jan. 31

	1978	1977
Shr Ernd	$1.35	a$1.06
Revenue	24,897,400	12,727,700
Earnings	2,213,100	1,590,300
3 Mo Shr	.27	a.25
Revenue	6,213,700	3,132,700
Earnings	447,600	393,000

a-Adjusted to reflect 50% stock dividend in December 1977

Computerworld Sales Offices

Vice-President/Marketing
Roy Einreinhofer
Advertising Administrator
Terry Williams
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
Phone: (617) 965-5800
Telex: USA-92-2529

Boston
Robert Ziegel
Northern Regional Manager
Mike Burman
Frank Collins
Account Managers
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
Phone: (617) 965-5800

New York
Donald E. Fagan
Eastern Regional Manager
Frank Gallo
District Manager
Peter Senft
Account Manager
COMPUTERWORLD
2125 Center Avenue
Fort Lee, N.J. 07024
Phone: (201) 461-2575

Los Angeles
Bill Healey
Western Regional Manager
Jim Richardson
Judy Milford
Account Managers
COMPUTERWORLD
1434 Westwood Boulevard
Los Angeles, Calif. 90024
Phone: (213) 475-8486

San Francisco
Bill Healey
Western Regional Manager
Jim Richardson
Account Manager
Donna Dezelan
Account Coordinator
COMPUTERWORLD
353 Sacramento Street
Suite 600
San Francisco, Calif. 94111
Phone: (415) 421-7330

Japan
Mr. Shigema Takahashi
General Manager
DEMPA/COMPUTERWORLD
1-11-15 Higashi Gotanda
Shinagawa-ku, Tokyo 141
Japan
Phone: (03) 445-6101
Telex: J2424461

United Kingdom
Tony Vickers
IDG PUBLISHING LTD.
140-146 Camden Street
London NW1 9PF
England
Phone: (01) 267-1201
Telex: UK-264737

West Germany
Hans-Jurgen Ballnath
COMPUTERWORLD GmbH
Friedrichstrasse 31
8000 Munich 40
West Germany
Phone: (089) 34-90-61
Telex: W.Ger-5-215250-HKFD

TRADE*QUOTES

Computerworld Stock Trading Summary

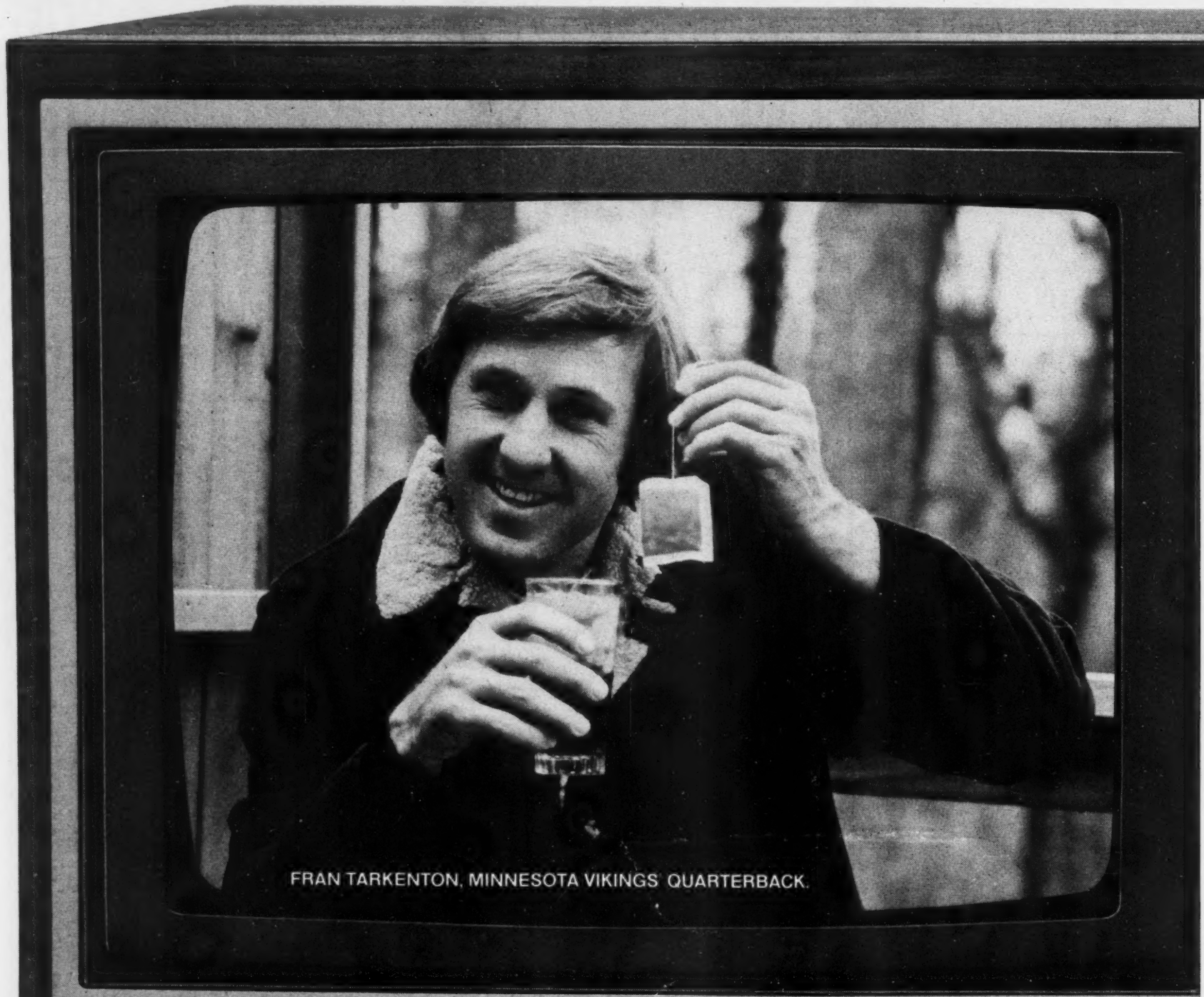
CLOSING PRICES WEDNESDAY, APRIL 26, 1978

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

EXCH		1977-78 RANGE (1)	CLOSE APR 26 1978	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	22- 55	54 1/2	+4 3/8	+8.7
N	BURROUGHS CORP	55- 91	69 7/8	+3 1/8	+4.6
O	COMPUTER AUTOMATION	18- 30	28 1/2	+2 3/4	+10.6
N	CONTROL DATA CORP	20- 29	28 3/4	+ 7/8	+3.1
O	CRAY RESEARCH INC	15- 40	37 3/4	-1 3/4	-4.4
N	DATA GENERAL CORP	35- 54	52	+2 3/8	+4.7
N	DATAPOINT CORP	18- 47	47 1/4	+ 3/8	+0.7
N	DIGITAL EQUIPMENT	37- 53	43 1/4	+1 5/8	+3.9
N	ELECTRONIC ASSOC.	2- 5	4 7/8	- 1/8	-2.5
A	ELECTRONIC ENGINEER.	8- 17	16 3/4	+ 7/8	+5.5
O	FCUR-PHASE SYSTEMS	13- 27	25	- 1/2	-1.9
N	FCXBORO	28- 54	35 7/8	+1 7/8	+5.5
O	GENERAL AUTOMATION	6- 10	9 7/8	+ 1/2	+5.3
O	GRI COMPUTER CORP	1- 1	1 1/8	0	0.0
N	HEWLETT-PACKARD CO	62- 87	75 1/8	+3 1/8	+4.3
N	HONEYWELL INC	43- 55	50 3/4	+1 1/4	+2.5
N	IBM	236-286	262 3/8	+9 3/8	+3.7
O	MANAGEMENT ASSIST	5- 15	14 3/4	+1	+7.2
O	MICRODATA CORP	7- 18	11 5/8	+ 5/8	+5.6
O	MINI-COMPUTER SYST	5- 12	5 3/4	- 1/4	-4.1
C	MODULAR COMPUTER SYS	5- 13	11 5/8	- 1/8	-1.0
N	NCR	32- 51	50	+1 3/8	+2.8
O	PRIME COMPUTER INC	12- 37	36 3/4	+4 1/4	+13.0
N	PERKIN-ELMER	17- 22	20 1/8	+1 5/8	+8.7
N	RAYTHEON CO	16- 42	41 5/8	+1 1/4	+3.0
N	SPERRY RAND	30- 42	39 1/2	+1 1/2	+3.9
O	SYCOR INC	8- 23	22 1/2	+ 3/4	+3.4
A	SYSTEMS ENG. LABS	5- 15	14 1/2	+ 7/8	+6.4
A	WANG LABS.	10- 19	18 5/8	+2 1/4	+13.7
	LEASING COMPANIES				
O	ALANTHUS CORP	3- 6	5 7/8	0	0.0
C	BOOTHE COURIER CORP	8- 16	16 5/8	0	0.0
O	COMDISCO INC	9- 16	16	+3	+23.0
A	COMMERCE GROUP CORP	1- 3	7/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	7/8	+	+7.6
M	DATRONIC RENTAL	0- 2	1 5/8	0	0.0
A	DCL INC	1- 4	2 3/4	+ 1/8	+4.7
N	DPF INC	6- 10	9 7/8	+ 3/8	+3.9
N	ITEL	13- 22	21 3/4	+2 7/8	+15.2
N	LEASCO CORP	19- 33	33	+ 1/2	+1.5
O	LEASPAC CORP	1- 2	1 3/4	+ 3/8	+27.2
A	PIONEER TEX CORP	5- 11	5 7/8	- 1/8	-2.0
N	U.S. LEASING	10- 16	14 1/8	+ 1/2	+3.6
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	0- 2	1	0	0.0
C	ANACOMP INC	7- 12	11 1/4	+ 1/4	+2.2
A	APPLIED DATA RES.	5- 13	12 1/2	+ 7/8	+7.5
N	AUTOMATIC DATA PROC	23- 30	29 3/4	+ 7/8	+3.0
O	COLEMAN AMERICAN COS	1- 2	1 3/8	0	0.0
O	COMPU-SERV NETWORK	8- 15	7 1/2	- 1/2	-6.2
C	COMP ELECTION SYSTMS	6- 10	9	0	0.0
C	COMPUTER HORIZONS	1- 2	2 1/4	0	0.0
O	COMPUTER NETWORK	6- 11	9 1/2	+ 3/8	+4.1
N	COMPUTER SCIENCES	7- 12	11 5/8	+ 3/4	+6.8
O	COMPUTER TASK GROUP	1- 2	2 1/4	+ 1/4	+12.5
O	COMPUTER USAGE	1- 3	2 5/8	0	0.0
O	COMSHARE	5- 11	10 1/2	+ 1/4	+2.4
O	DATA DIMENSIONS INC	3- 5	4 1/4	0	0.0
O	DATATAB	1- 2	1 1/4	0	0.0
N	ELECTRONIC DATA SYS.	14- 20	18 1/8	- 1/8	-0.6
O	INSYTE CORP	2- 3	1 1/2	0	0.0
O	IPS COMPUTER MARKET.	1- 2	2 1/4	0	0.0
O	KEANE ASSOCIATES	3- 4	3 3/4	+ 1/2	+15.3
O	KEYDATA CORP	1- 3	2 1/8	- 3/8	-15.0
A	LOGICON	7- 17	12 3/4	- 1/8	-0.9
A	MANAGEMENT DATA	1- 2	1 1/4	+ 1/8	+11.1
A	NATIONAL CSS INC	10- 20	20	+1 1/4	+6.6
O	NATIONAL DATA CORP	4- 11	10 1/2	+1 1/2	+16.6
A	ON LINE SYSTEMS INC	16- 24	21 3/8	- 7/8	-3.9
N	PLANNING RESEARCH	3- 6	4 7/8	- 1/8	-2.5
C	PROGRAMMING & SYS	1- 1	3/4	+ 1/8	+20.0
O	RAPIDATA INC	2- 5	4 1/2	+ 3/8	+9.0
C	REYNOLDS & REYNOLD	17- 25	24	+ 1/4	+1.0
O	SCIENTIFIC COMPUTERS	1- 4	4 7/8	+ 3/8	+8.3
O	TYMSHARE INC	14- 23	21 5/8	- 1/8	-0.5
A	UPS SYSTEMS	4- 6	6	+ 1/8	+2.1
N	WYLY CORP	1- 5	4 3/8	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	10- 20	18 3/8	- 1/2	-2.6
O	ADVANCED MEMORY SYS	7- 12	11 7/8	+ 7/8	+7.9
N	AMPEX CORP	8- 14	14 1/4	+1	+7.5
O	ANDERSON JACOBSON	3- 7	6 1/2	+1	+18.1
N	APPLIED DIG DATA SYS	10- 20	14 3/8	+ 1/8	+0.8
O	BEEHIVE INT'L	5- 12	5 3/8	- 1/8	-2.2
A	BOLT,BERANEK & NEW	6- 9	7 1/4	+ 1/4	+3.5
N	BUNKER-RAMO	8- 15	14 5/8	+ 5/8	+4.4
A	CALCOMP	3- 6	6 1/4	+ 3/4	+13.6
C	CAMBRIDGE MEMORIES	1- 4	3 3/4	+ 1/4	+7.1
N	CENTRONICS DATA COMP	16- 30	19	- 3/8	-1.9
C	COGNITRONICS	1- 1	3/4	0	0.0
O	COMPUTER COMMUN.	5- 8	9 5/8	- 1/8	-1.2
O	COMPUTER CONSOLES	4- 7	6	+ 1/4	+4.3
A	COMPUTER EQUIPMENT	2- 5	4 3/4	+ 5/8	+15.1
O	COMPUTER TRANSCEIVER	1- 1	1 3/8	0	0.0
O	COMTEN	9- 19	18 3/4	+2 7/8	+18.1
N	CONPAC CORP	19- 28	21 1/8	- 1/2	-2.3
O	DATA ACCESS SYSTEMS	4- 5	4 1/2	- 1/4	-5.2
O	DATA 100	6- 15	14 1/2	+ 5/8	+4.5
A	DATA PRODUCTS CORP	9- 19	18 7/8	+2 1/8	+12.6
O	DATA TECHNOLOGY	3- 4	4	- 1/4	-5.8
O	DATUM INC	1- 4	3 7/8	0	0.0
O	DECISION DATA COMPUT	2- 3	1 3/4	+ 1/8	+7.6
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
A	DOCUMATION INC	6- 15	14 5/8	+1 1/2	+11.4
O	DATARAM CORP	2- 24	20	+3	+17.6
N	ELECTRONIC M & M	4- 6	5 3/8	+ 3/8	+7.5
O	FABRI-TEK	1- 2	1	+	+6.6
O	GENERAL COMPUTER SYS	0- 2	1 1/4	0	0.0
N	HAZELTINE CORP	8- 15	13 1/4	+ 1/2	+3.9
N	HARRIS CORP	28- 54	53 1/2	+4 1/2	+9.1
O	INFOREX INC	4- 8	7 1/2	+ 1/8	+1.6
O	INFORMATION INTL INC	8- 14	9 3/4	+ 1/4	+2.6
O	INTEL CORP	38- 57	51	+2 1/2	+5.1
A	LUNDY ELECTRONICS	3- 6	4	0	0.0
O	MSI DATA CORP	6- 15	15	+1 1/4	+9.0
N	MEMOREX	23- 40	38 5/8	- 1/4	-0.6
N	MOHAWK DATA SCI	5- 9	8 7/8	- 1/8	-1.3
O	PENRIL CORP	2- 8	7 1/4	0	0.0
N	PERTEC CORP	7- 12	11 3/4	+ 1/8	+1.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 2	2	0	0.0
O	QUANTOR CORP	3- 5	3 5/8	+ 5/8	+20.8
O	RECOGNITION EQUIP	6- 10	7 3/4	+ 1/8	+1.6
O	SCAN DATA	1- 3	2 1/2	+ 1/8	+8.0
O	STORAGE TECHNOLOGY	10- 35	33 1/8	+ 3/8	+1.1
O	T BAR INC	7- 19	17	0	0.0
O	TALLY CORP.	4- 9	8 7/8	+ 5/8	+7.5
A	TEC INC	6- 10	8	+ 3/8	+4.9
N	TEKTRONIX INC	29- 41	41	+2 1/4	+5.8
N	TELEX	2- 5	5 3/8	+ 3/4	+16.2
O	TESDATA SYSTEMS CP	13- 20	16 1/4	+1 1/4	+8.3
O	WILTEK INC	1- 1	1/2	0	0.0
	SUPPLIES & ACCESSORIES				
A	AMERICAN BUS PRODS	6- 9	8 1/4	- 1/4	-2.9
O	BALTIMORE BUS FORMS	1- 4	3 1/4	+ 1/4	+8.3
A	BARRY WRIGHT	10- 21	20 7/8	+1	+5.0
C	CYBERMATICS INC	1- 1	7/8	0	0.0
O	DUPLEX PRODUCTS INC	14- 21	20 1/2	+ 1/8	+0.6
N	ENNIS BUS. FORMS	6- 12	12	+ 1/2	+4.3
N	3M COMPANY	43- 56	51	+4 1/4	+9.0
O	MOORE CORP LTD	24- 37	29 1/2	+ 1/2	+1.7
N	NASHUA CORP	16- 28	27	- 5/8	-2.2
O	STANDARD REGISTER	18- 26	25 1/2	+3	+13.3
O	TAB PRODUCTS CO	8- 19	10 7/8	+1 5/8	+17.5
N	UARCO	18- 24	24 1/8	+ 1/4	+1.0
A	WABASH MAGNETICS	10- 15	12 1/4	- 1/2	-3.9
N	WALLACE BUS FORMS	17- 23	23	+ 1/8	+0.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; W=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

NOT ICED TEA, FRAN. ACCOUNTS PAYABLE.



Fran Tarkenton's product isn't iced tea, it's the MSA Accounts Payable System.

The hottest A/P system on the market, MSA Accounts Payable offers users these important benefits:

- Detects duplicate invoices
- Optimizes discounts
- Makes vendor payment recommendations
- Provides for recurring payments
- Projects disbursements for any number of days

In addition, it records use tax dollars and offers a variety of check writing features.

MSA's Accounts Payable System, as well as MSA's other systems, interfaces with MSA's General Ledger System.

For more information about MSA's Accounts Payable System or any of MSA's complete line of financial software systems, call Carole McConnell at (404) 262-2376, or return this coupon.

MSA
THE FINANCIAL SOFTWARE COMPANY

Management Science America, Inc.
3445 Peachtree Road, N.E., Dept. C-1
Atlanta, Georgia 30326
(404) 262-2376

Chicago (312) 986-2450
Los Angeles (213) 822-9766
New York (201) 871-4700

International Agent:
MSA International, Inc.
Brussels, Belgium Tel. (02) 673.99.63
Telex 63020 Answerback: MSA B

Name

Company Title

Address

City State Zip

Phone Computer Model

I am interested in:
- ☐ Accounts Payable
- ☐ Accounts Receivable
- ☐ General Ledger/Financial Information Control (FICS)
- ☐ Human Resource System
- ☐ Supplies Inventory Control and Purchasing
- ☐ Fixed Assets Accounting
- ☐ Payroll Accounting
- ☐ ALLTAX ™
- ☐ Canadian Payroll Accounting